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UNIVERSITY OF ALBERTA

PATTERNS OF STRESS AND SUPPORTS IN FAMILIES WITH HANDICAPPED CHILDREN: ASSESSMENT AND INTERVENTION

BY

ANTHONY McCLELLAN

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION IN SCHOOL PSYCHOLOGY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

FALL 1990

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The undersigned certify that they have read and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled PATTERNS OF STRESS AND SUPPORTS IN FAMILIES WITH HANDICAPPED CHILDREN: ASSESSMENT AND INTERVENTION submitted by Anthony McClellan in partial fulfilment of the requirements for the degree of MASTER OF EDUCATION in SCHOOL PSYCHOLOGY.

DR. G.M. KYSELA

DR. L. McDONALD

DR. G. BISANZ

Date: Oct 11/90

ABSTRACT

Despite the presence of considerable debate, the literature generally supports the hypothesis that families with handicapped children experience significantly more stress than families of non-handicapped children. These levels of stress, however, do not appear to lead irrevocably to the psychological distress of the parent or dysfunction within the family system. Studies undertaken from the perspective of coping indicate that many families adapt and thrive despite the presence of a handicapped child. In an effort to understand some of these ambiguous findings, researchers have turned to conceptual frameworks that provide a multidimensional perspective on family adaptation. One such framework, the T-Double ABCX Model, views family adaptation as the relationship between the pile-up of demands on the family and the family's psychological, social and material resources, as well as the individual and group problem solving skills of family members.

The present investigation examined data from two recent studies of stress and coping in families with preschool handicapped children. Both the study conducted by Reddon (1989), and the Family Intervention Project (Kysela & McDonald, in progress) used the T-Double ABCX model in their investigations of family adaptation. The initial stage of the present study involved a post hoc comparison of self-report measures related to the T-Double ABCX Model. Although these comparisons revealed an essentially similar pattern of stress, coping and resources for the parents involved in both studies, some differences were found in the mother/father patterns of stress related to the parenting role. Fathers in the Family Intervention Project reported a greater sense of isolation, while mothers appeared to feel less restricted by the parenting role.

The second phase of the study involved the examination of self-report data and observations of parent-child interaction collected prior to and following each of two treatments carried out during the Family Intervention Project. Decreases in mean

levels of stress were obtained for the eleven participants who completed stress management training, on two of the thirteen sources of stress studied. An examination of the pre and post-intervention data failed to indicate a significant change in the self-report data of the seven parents who participated in an intervention involving training in the use of a series of ecologically based teaching strategies. Analysis of videotaped interaction sequences collected on four mother-child dyads suggested that two of the mothers modified their interactional strategies in the predicted direction.

It was concluded that the results of the Family Intervention Project provided only modest support for interventions involving stress management training and group instruction in the use of interactional strategies. A lack of clear treatment effect, accompanied by some non-significant trends apparent in these data, indicate the need for future studies which address issues related to the intensity of treatment and the match between the needs of individual participants and the form and content of the interventions.

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Finally, the greatest contribution was made by the parents who participated at every step of this project. Their energy and concern attests to their dedication to the difficult job of parenting.

TABLE OF CONTENTS

CHAPTER

1. INTRODUCTION 1

    The Problem 2

    Statement of the Problem 2

    Glossary of Terms 4

2. REVIEW OF THE LITERATURE 5

    Introduction 5

    Stress and Coping in Families with Handicapped Children 6

        Effects of Parenting a Handicapped Child 8

            Effects of Parenting: Mother-Father Differences 9

            Effects of Parenting: Marital Adjustment 11

            Effects of Parenting: Parent-Child Interaction 14

        Characteristics of the Stressor: the Child 16

        Mediating Factors In Stress 20

            Personal Factors 21

            Demographic Variables 23

            Social Support 25

        Summary of the Literature on Stress and Coping 28

    Multidimensional Approaches 28

        The T-Double ABCX Model 29

        Support for The T-Double ABCX Model 34

    Intervention Studies 37

        Coping Skills and Stress Management Training 38

        Enhancing Parent Child-Interactions 40

    Summary of the Literature 43

CHAPTER

3. RATIONALE AND RESEARCH QUESTIONS....................46
    Introduction....................46
    Between Group Comparisons on Measures of Stress and Coping....................47
    Stress Management Training....................49
    Natural Teaching Strategies....................50
    Combined Effects of Intervention....................51
    Operational Definitions....................52
4. METHODOLOGY....................55
    Participants....................55
    Project Personnel....................56
    Assessment Procedures....................57
    Research Design....................58
    Independent Variable....................62
        Format....................62
        Intervention 1-Natural Teaching Strategies....................63
        Intervention 2-Stress Management Training....................69
    Instrumentation....................73
        Descriptive Measures....................74
            Pile-Up (AA Factor)....................74
            Family Adaptation (XX factor)....................76
        Descriptive and Dependent measures....................76
            Pile-Up (AA factor)....................76
            Family Resources (BB Factor, and BBB Factor)....................77
            Family Problem Solving and Coping (PSC factor)....................79
            Family Appraisal (CC Factor)....................80
            Measures of Parent-Child Interaction....................81

CHAPTER

Turntaking Measures 82
Measures of Teaching Strategies 83
Observer Training and Reliabilities 83
Threats to Validity 86
Internal Validity 86
External Validity 89
Ecological Validity 89
5. RESULTS 92
Results of Descriptive Measures 92
The Parents 93
The Children 97
Comparative Analysis of Self-Report Measures 98
Measures of Pile Up 100
Measures Family Resources 107
Measures of Social Support 113
Measures of Problem Solving and Coping Skills 119
Measures of Appraisal 124
Measures of Family Adaptation 129
Summary and Integration of Descriptive and Self-Report Data 135
Intervention Effects on Self-Report Measures 139
Effects of Stress Management Training 140
Effects of Natural Teaching Strategies 151
Effects of Combined Intervention 155
Effects of Intervention on Parent-Child Interaction 156
Dyad A 159
Description of Dyad A 159

CHAPTER

Description of Baseline Observations for Dyad A 160

Changes in Utilization of Communication Modes for Dyad A 161

Changes in the use of Teaching Strategies for Dyad A 165

Summary of Post-Intervention Results for Dyad A.........167

Dyad B............167

Description of Dyad B............167

Description of Baseline Observations for Dyad B............168

Changes in Utilization of Communication Modes for Dyad B............169

Changes in the use of Teaching Strategies for Dyad B 173

Summary of Post Intervention Results for Dyad B..........173

Dyad C 175

Description of Dyad C 175

Description of Baseline observations for Dyad C............176

Changes in Utilization of Communication Modes for Dyad C 177

Changes in the use of Teaching Strategies for Dyad C............177

Summary of Post Intervention Results for Dyad C..........182

Dyad D............182

Description of Dyad D............182

Description of Baseline Observations for Dyad D 184

CHAPTER

Changes in Utilization of Communication Modes for Dyad D....184

Changes in the Use of Teaching Strategies for Dyad D....188

Summary of Post Intervention Results for Dyad D....188

Summary of Intervention Effects on Parent-Child Interaction....190

6. DISCUSSION....196

Discussion of Results....196

Descriptive Data....196

Effect of Stress Management Training on Self-Report Measures....200

Effect of Natural Teaching Strategies on Self-Report Measures....202

Intervention Effects on Parent-Child Interaction....203

Effect of Intervention on Dyads A and C....204

Limitations....205

Procedural Limitations....205

Limitations of the Intervention Component of the Study....206

Content and Implementation of Stress Management Training....208

Content and Implementation of Natural Teaching Strategies....209

Directions for Future Research....210

Content of the Intervention....210

Parent Participation....212

CHAPTER

Conclusion 213

REFERENCES 215

APPENDIX A 225

APPENDIX B 230

APPENDIX C 233

APPENDIX D 237

APPENDIX E 247

APPENDIX F 252

APPENDIX G 258

APPENDIX H 264

APPENDIX I 270

LIST OF TABLES

TABLE 1. Order of Intervention for Each of the Treatment Groups 59

TABLE 2. Overview of Teaching Strategies 65

TABLE 3. Overview of Stress Management Training 70

TABLE 4. Calculations of Reliability for Preschool Observation Scale (POS) 85

TABLE 5. Calculations of Reliability for Teaching Strategies 87

TABLE 6. Attrition rate 94

TABLE 7. Characteristics of Parents 95

TABLE 8. Characteristics of the Children 99

TABLE 9. Means, Standard Deviations and Statistical Significance (p) of Scores for Mothers and Fathers on the Parenting Stress Index (PSI) 101

TABLE 10. Means, Standard Deviations and Statistical Significance of Scores (p) for Mothers and Fathers on Family Inventory of Resources for Management (FIRM). 109

TABLE 11. Means, Standard Deviations and Statistical Significance (p) of Scores for Mothers and Fathers on the Social Support Inventory (SSI) 115

TABLE 12. Means, Standard Deviations and Statistical Significance (p) of Scores for Mothers and Fathers on the Coping Health Inventory for Parents (CHIP) 120

TABLE 13. Means, Standard Deviations and Statistical Significance (p) of Scores for Mothers and Fathers on the Concepts of Development Questionnaire (CODQ). 126

TABLE 14. Means, Ranges and Standard Deviations of Scores for Mothers and Fathers on Family Assessment Measure (FAM). 131

TABLE 15. Comparison of Mean Scores for the Participants and Non-participants on the Family Assessment Measure (FAM) 132

TABLE 16. Comparison of Means Before and After Stress Management Training on the Parenting Stress Index (PSI)..........142

TABLE 17. Comparison of Means Before and After Stress Management Training on the Social Support Index (SSI)..........144

TABLE 18. Comparison of Means Before and After Stress Management Training on the Family Inventory of Resources for Management (FIRM)..........145

TABLE 19. Comparison of Means Before and After Stress Management Training on the Coping Health Inventory for Parents (CHIP)..........147

TABLE 20. Comparison of Means Before and After Stress Management Training on the Concepts of Development Questionnaire (CODQ)..........148

TABLE 21. Measures of Interactive Balance and Match for Dyad A..........162

TABLE 22. Measures of Interactive Balance and Match for Dyad B..........170

TABLE 23. Measures of Interactive Balance and Match for Dyad C..........178

TABLE 24. Measures of Interactive Balance and Match for Dyad D..........185

LIST OF FIGURES

FIGURE 1. Modified T-Double ABCX Model......30
FIGURE 2. Mother/Father Comparisons of Total Scores on the FIRM......112
FIGURE 3. Mother/Father Comparisons of Total Scores on the CHIP......122
FIGURE 4. Mother/Father Comparisons of Total Scores on the CODQ......127
FIGURE 5. Mother/Father Comparisons of Total Scores on the FAM......133
FIGURE 6. CODQ Scores Before and After Stress Management Training......149
FIGURE 7. Change in Mode Utilized by Mother A......163
FIGURE 8. Change in Mode Utilized by Child A......164
FIGURE 9. Change in Teaching Strategies Utilized by Mother A......166
FIGURE 10. Change in Mode Utilized by Mother B......171
FIGURE 11. Change in Mode Utilized by Child B......172
FIGURE 12. Change in Teaching Strategies Utilized by Mother B......174
FIGURE 13. Change in Mode Utilized by Mother C......179
FIGURE 14. Change in Mode Utilized by Child C......180
FIGURE 15. Change in Teaching Strategies Utilized by Mother C......181
FIGURE 16. Change in Mode Utilized by Mother D......186
FIGURE 17. Change in Mode Utilized by Child D......187
FIGURE 18. Change in Teaching Strategies Utilized by Mother D......189
FIGURE 19. Changes in Utilization of Communication Modes by Pairs of Dyads......191
FIGURE 20. Change in the Ratio of Mode-Matched Exchanges......193
FIGURE 21. Frequency of Mode Use Following Natural Teaching Strategies......195

Chapter 1

INTRODUCTION

The Problem

During the past decade there has been a dramatic increase in research in the area of family adaptation, family support and stress in families with handicapped children (Wikler, 1986). This interest appears to have originated from two main sources, the movement towards deinstitutionalization and the proliferation of early intervention services for handicapped children (Farber, 1986; Wikler, 1986).

Associated with this interest is the increasing acceptance of the assumption that "family functioning and child development are inextricably intertwined" (Frey, Greenberg, & Fewell, 1989, p. 240). Growing awareness of the importance of the social context to child development has led to a broadened conceptualization of early intervention. The family system is now being viewed as a legitimate, and perhaps essential target for intervention services (Dunst, Snyder, & Mankinen, 1987). As a result of these trends, there is a perceived need to go beyond measures of child outcomes and examine more ecologically relevant indicators of program effectiveness. In addition, there is recognition that our present knowledge of families with handicapped children is inadequate (Crnic, Friedrich, & Greenberg, 1983).

Despite the gaps in our understanding of the adaptation of these families, there appears to be support for the suggestion that the presence of a handicapped child can place significant demands on parental coping, as well as the cummulative resources of the family unit. Recent studies of families with handicapped children have linked stress to increased rates of depression (Breslau & Davis, 1986; Quine & Pahl, 1985), lower levels of marital satisfaction (Friedrich & Friedrich,1981) and decreased maternal responsiveness (Marcovitch, 1985). There has been a tendency to view this type of evidence of family maladaption from a "stress-reaction" model in which the family is overwhelmed by the demands of parenting a handicapped child (Frey et al.,1989).

Studies undertaken from the perspective of adaptation and coping, however, indicate that many families adapt and thrive, despite the presence of a handicapped child.

These contradictory findings, and the often ambiguous nature of the literature in this area, have lead investigators to search for theoretical frameworks that take into account the multiplicity of factors that contribute to adaptive functioning within the family. Recent investigators have employed a cognitive coping model (Friedrich, Cohen, &Wilturner, 1987), as well as theoretical frameworks borrowed from the field of family studies (Bristol, 1987; Mines, 1988). These models offer considerable promise in deepening our understanding of the processes involved in family adaptation, and in providing direction for intervention efforts. Wikler (1986), however, points out that the family stress theories that have been proposed have not received sufficient elaboration or testing. Clearly, there appears to be a need to establish the utility of such frameworks for the dual purposes of enhancing our understanding of stress and coping in families with handicapped children and in the design of effective interventions.

Statement of the Problem

Two recent investigations, including Reddon (1989) and the Family Intervention Project, utilized the T-Double ABCX Model of Family Adaptation (McCubbin & Thompson, 1987) as a framework to study sources of stress and supports in families with young, moderately to severely handicapped children. Reddon (1989) used the model to study the relative contributions of the pile-up of stressors, family resources, social support, coping patterns and problem solving strategies to the adaptive functioning of 16 families of handicapped preschoolers. Extending this research, the T-Double ABCX Model was used in the selection of measures and the design of treatments for the Family Intervention Project, a program involving a population virtually identical to that of Reddon's (1989) study.

The present study had two major objectives. In the initial phase of this investigation, baseline data from the intervention project was used in a post hoc comparison with the results of the earlier study (Reddon,1989). Comparison of these data sets was carried out to establish if the results of the Reddon (1989) study are representative of a larger group of families with young, handicapped children. In addition, the comparison was also undertaken to help determine the appropriateness of using the T-Double ABCX Model in understanding some of the critical factors underlying family adaptation to the demands of raising a handicapped child.

The second objective of the study involved an examination of the impact of interventions involving the use of stress management techniques and ecologically validated teaching strategies on a number of outcome measures. Self-report data on a group of parents selected from a larger pool of participants was examined at three data points. These parents were selected because they had attended all, or most of the training sessions, as well as completing the majority of the self-report measures. Descriptive analysis of observational measures of parent-child interaction were also conducted on four mother-child dyads at three points throughout the study. These analysis were completed to allow for the formulation of tentative hypothesis about the effectiveness of each intervention.

The following literature review will provide an overview of the stress related effects that have been, at one time or another, associated with parenting a handicapped child. In addition, factors which seem to determine the extent or severity of these effects will be described. The review will also demonstrate how the T-Double ABCX Model can be used to integrate some of these diverse findings within a single conceptual framework. Finally, intervention studies that seem to have some relevance to a family's adaptation to the presence of a handicapped child will be reviewed. A definition of terms that may have specialized or ambiguous meanings will be presented prior to this review.

Glossary of Terms

Stressor: In the context of the present study, stressors include events which effect the family, as well as the individual. Family stressors include life events or transitions impacting upon the family unit, which have the potential for producing change in that family system (McCubbin & Thompson, 1987). Lazarus (1984) provides a useful typology of individual stressors including: 1). minor environmental events such as unwanted contacts with professionals, 2). chronic environmental conditions such as poor housing, 3). ongoing worries and concerns such as anticipation of major transitions in the child's life, 4) distressed emotional reactions such as feelings of isolation.

Stress: Experiences and conditions that are appraised by the individual as being harmful or threatening (Lazarus, 1984). Family stress includes all those events and transitions for which the family feels unprepared.

Resources: Resources, as the term is used in the present study, refers to set of material resources, social support networks, belief systems and problem solving skills that the individual or family unit can call upon to deal with chronic stressors or a crisis (Frey et al., 1989).

Coping: Is an active response to a stressor which involves the interaction and mobilization of the resources described above (McCubbin & Thompson, 1987).

Social support: Social support is a broad concept that includes all those individuals, groups and institutions that enable an individual to cope with stresses through the provision of assistance in various degrees and forms (Schilling, Gilchrist, & Schinke, 1984).

Chapter 2

REVIEW OF THE LITERATURE

Introduction

A considerable body of research dealing with stress and coping in families with handicapped children has accumulated over the past three decades. While this literature is comprehensive, it is has also been described as, ambiguous, inconsistent, and at times contradictory (Crinic et al.,1983). Early studies painted a grim picture of the effects of the presence of a handicapped child on the psychological well-being of the parents, and the integrity of the family. These early investigations were accused of "rallying around the flag of anticipated pathology" (Crnic et al.,1983, p. 126). Even the most recent studies documenting elevated levels of parental stress or marital discord have been criticized on methodological grounds (Dyson & Fewell, 1986). Nonetheless, there appears to be substantial support for the hypothesis that the presence of a handicapped child increases the potential for stress-related difficulties. In fact, the wealth of evidence lead Crnic et al. (1983) to conclude that "parents and siblings of retarded children individually as well as the family as a whole are at-risk for numerous difficulties in comparison to families with nonretarded children" (p. 132).

Another, equally important finding to arise out of this body of literature is the variability in the adequacy of family adaptation to the presence of a handicapped child. It appears clear that while some families are severely disrupted, others appear to have little difficulty adapting to the additional demands involved in caring for a disabled child (Longo & Bond, 1984; Venters, 1981). In an attempt to understand the processes involved, research has broadened beyond a simple examination of child related factors to encompass those characteristics of the parent, and the family, as well as the broader social and economic environment that appear to buffer or exacerbate the effects of stress.

The following review of the literature will examine three main areas of research. First an overview of the literature on stress and coping in families with handicapped children will be presented. Emphasis will be given to those studies which examine the effects on individuals and family relationships attributed to the presence of a handicapped child, as well as studies of the factors which appear to buffer or contribute to these effects. Secondly, a brief description of theoretical frameworks which have been used to integrate the diverse findings in the literature will be presented, with particular attention to the T-Double ABCX Model (McCubbin & Patterson, 1983) of family adaptation. The final portion of this review is concerned with relevant intervention studies.

Stress and Coping in Families with Handicapped Children

Much of the literature on the effects of parenting a handicapped child, published prior to the present decade, is depressing in tone and unequivocal in terms of the conclusions drawn. Generally, this literature suggests that raising a handicapped child results in significant costs to both the integrity of the family unit, and the psychological well-being of the parents; particularly that of the mother. In their review of the early literature in this area, Gallagher, Beckman, and Cross (1983) cite studies which indicate significantly higher rates of divorce, suicide, and the potential for child abuse among this population. Psychological and social costs such as isolation, decreased social mobility, as well as higher levels of anxiety, depression, anger, and guilt have also been reported (Crnic et al., 1983; Gallagher et al., 1983)

A particularly disturbing, and at times poignant, example of this type of literature is provided by Holt's (1958) investigation of the plight of 170 families of handicapped children in a large industrial city in England. Based on interviews with the mothers of these children, and confirmed through discussions with mental health workers, Holt paints a bleak picture of isolated dysfunctional families. He describes the parents as physically and psychologically exhausted. Depression, weight loss, and even suicide attempts were reported during the interviews. The siblings of the handicapped child were described as neglected and resentful. The grimmest picture, however, was reserved for the mothers of these children. Holt described many of them as "pale and worn out by the strain of caring for their retarded child" (p.747).

Early studies such as Holt's (1958) have come under considerable criticism. It has been suggested that much of this literature was heavily influenced by both clinical impression and psychodynamic analysis (Longo & Bond, 1984; Schilling, Gilchrist & Schinke, 1984). Concerns have also been raised, however, about more recent investigations employing empirically based methodology. Crnic et al. (1983) noted a number of flaws in the design and methodology of these studies including: 1) the use of single outcome measures, 2) utilization of measures with questionable psychometric properties, and 3) viewing the problem from a single perspective, and 4) a lack of control groups. To this list Dyson and Fewell (1986) add two other shortcomings, the wide range of ages in the subjects and a failure to examine the factors that might mediate the effects of parenting a handicapped child.

Despite these criticisms, certain common themes appear throughout the literature. Holt (1958), for example, identified three areas as significant sources of stress which continue to demonstrate strong associations with maternal depression including: 1) care-giving demands, 2) supervision of children with behavior problems, and 3) attending to children with disturbed sleep/wake cycles. Just as importantly, Holt also identified a coping strategy that has subsequently received considerable empirical support; situational appraisal. Holt suggested that the parents who appeared to have greater coping capabilities, maintained realistic expectations, while being thankful for the child despite his/her limitations.

Hence in the remainder of this review an attempt will be made to balance the need for caution, with an effort to identify and provide support for common themes in the literature. The following section will deal with recent efforts to describe the effect of parenting a handicapped child on the psychological well-being of the parent and the quality of the parent-child relationship.

Effects of Parenting a Handicapped Child

Typically, the psychological well-being of the parents of handicapped children has been measured through self-report instruments such as The Parenting Stress Index, or the Malaise Inventory. Evidence of significant differences between the parents of physically disabled, chronically ill and retarded children, and parents of nonhandicapped children on these types of measures have been found repeatedly in the literature. Cummings, Bayley, and Rie (1966) reported that mothers of handicapped children experienced higher levels of depressive affect, preoccupation, difficulty handling anger at the child, and a lower sense of maternal competence compared to the mothers of nonhandicapped children. The highest mean scores obtained for any sample to which the Malaise Inventory had been applied were reported for the mothers of 303 severely disabled children by Bradshaw and Lawton (1978), and replicated by Quine, and Pahl (1985).

In a longitudinal study of depression, Breslau and Davis (1986) compared rates of depression in 310 mothers of children with cystic fibrosis, cerebral palsy, mylodysplasia, and multiple physical handicaps, with a control group of mothers of normally developing children. Depressive symptomatology was defined by structured psychiatric interview. Mothers of handicapped children obtained significantly higher rates of depressive symptomatology, even when disparities in education and income were partialled out.

Of particular relevance to the present investigation are studies involving the parents of pre-school handicapped children. In a recent study, Dyson and Fewell (1986) found that parents of handicapped children attending community pre-school and kindergarten programs reported significantly higher levels of stress on the Questionnaire related to Resources and Stress (QRS-F).

Waisbern (1980) studied the impact of the birth of a handicapped child on American and Danish families. In comparison to control groups from their respective countries, parents of developmentally disabled children reported a greater sense of hopelessness, anger, and rejection, along with the feeling that the changes they had experienced since the birth of their child were more negative than positive. Further, these results were remarkably similar for both countries.

Effects of Parenting: Mother-Father Differences

While the majority of studies dealing with stress in families with handicapped children have dealt primarily with mothers (Gallagher et al., 1983), the father's role and responses have been the subject of recent investigations. Some of the earlier literature suggested that fathers of handicapped children were uninvolved; almost peripheral to the family structure (Gallagher et al., 1983). Kazak and Marvin (1984), however, argue that the clinical impression of an uninvolved father could be a misinterpretation of a highly functional spousal sub-system. These authors suggest that each parent adopts a highly specialized role in an attempt to adapt to the pressures of parenting a handicapped child, and the additional financial burden. In this case, the mother assumes primary responsibility for child care, while the father focuses his energies on the provision of material resources. The isolation experienced by one or both parents is a limitation in an otherwise adaptive arrangement.

Kazak and Marvin (1984) base this hypothesis on a comparison of stress and social networks in the families of spina bifida and non-handicapped children. The results of the study indicated that mothers of spina bifida children obtained the highest scores on the Parenting Stress Index compared to their spouses, as well as both parents in the control group. The stresses reported by these mothers, however, were not related to the marital relationship but focused on parenting issues and child characteristics. These parents actually obtained higher levels of marital satisfaction than a control group of couples with a nonhandicapped child. While theories involving role specialization may have some heuristic value, studies that control for financial burden, and compare families slong a continuum of role specialization are needed to move it out of the speculative realm.

The majority of studies that have examined differences in spousal responses to parenting a handicapped child generally lead to the conclusion that the mother experiences a greater degree of stress. Goldberg, Marcovitch, MacGregor, and Lojkasek (1986) compared the responses of families with Down Syndrome, neurologically impaired, and mentally retarded children of unknown etiology. Fathers from all three groups obtained higher scores on measures of self-esteem and internal locus of control, while reporting significantly less psychological distress than their spouses.

In a study involving the parents of Down Syndrome children and a control group of families with children demonstrating a similar level of retardation, Gath and Gumley (1986) found significantly higher levels of psychiatric indicators among mothers of both groups compared to their husbands. Dunst et al. (1986) also found that mothers reported a greater impact on their physical and emotional health, as well as a higher level of time demands, than did fathers of handicapped pre-school children.

In contrast to the studies discussed up to this point, Cummings (1976) found that fathers of mentally retarded children demonstrated a greater sense of dysphoria, preoccupation, along with lower levels of self-esteem and enjoyment of their child. These results led the investigator to conclude that "many fathers of mentally retarded children undergo long term personality changes which resemble a pattern of neurotic life constriction" (p.252). This study suggests that fathers are by no means unaffected by the presence of a handicapped child, however, methodological limitations related to use of projective measures and the possibility of biased sampling indicate that some caution needs to be exercised when reviewing these results.

Finally, in a study published after the inception of the present investigation, Damrosch and Perry (1989) examined perceived adjustment amongst parents of Down Syndrome children. The results of this study suggest that mother-father differences may exists in both the degree of distress associated with the birth of a handicapped child, and the pattern of eventual adjustment. Mothers in the study reported higher levels of self- blame and negative affect. Further, these mothers felt that their pattern of adjustment was episodic, involving peaks and valleys. Fathers, in contrast, described their adjustment as one of steady improvement.

These studies, taken together, seem to suggest that parenting a handicapped child has different meanings for fathers and mothers. Mothers, by and large, appear to carry the brunt of child-related stress. Whether this stress is a result of the actual demands of child care, or confounded by socialization is unclear. Milgram and Atzil (1989), for example, found that life satisfaction reported by mothers of autistic children was tied to their perception of the fairness of their share of child-care responsibilities. Fathers' life satisfaction, on the other hand, appeared to be related to the actual amount of child-care duties, increasing in direct porportion to the number of child-care activities engaged in.

Effects of Parenting: Marital Adjustment

The impact of parenting a handicapped child on the stability of the marital relationship, and the degree of spousal satisfaction with this relationship, has been a concern of a number of studies. Holt's (1958) interview data suggested that mothers would frequently ignore their husbands, devoting themselves almost entirely to the care of their child. Marcus (1977) claimed that the stresses associated with caring for a psychotic child left the parents little time for each other and rendered them ineffective as marriage partners.

More recent, empirically based studies do not paint such a clear relationship between parenting a handicapped child and marital strain. Several reviews (Longo & Bond , 1984; Friedrich et al., 1987; Gallagher et al, 1983) have found conflicting evidence related to the issue of marital satisfaction and stability. In a brief review, Longo and Bond (1984) presented 10 studies conducted between 1959 and 1980 that found little or no evidence of increased rates of marital discord in parents with handicapped children. Since these authors reviewed the literature from the perspective of coping, however, these findings may not reflect the full range of studies related to marital adjustment.

The research on this aspect of parenting a handicapped child appears to fall into three major types including: divorce-rate data, between group comparisons of marital satisfaction, and within-group analysis of the variables related to marital satisfaction.

Divorce-rate data. Reports of high divorce rates amongst the parents of handicapped children have appeared in several reviews of the literature (e.g., Gallagher et al.,1983; Longo & Bond, 1984). A study by Laurence, Payne and Rounsley (1977) cited in Longo and Bond (1984) for example, reported divorce rates amongst parents of spina bifida children to be nine times that of the surrounding community. Subsequent re-analysis however, significantly lowered that ratio to a level one and one-half times greater. In a relatively recent study, no differences in divorce-rate were found in a comparison of families with genetically handicapped children and non-handicapped children (Roesel & Lawlis, 1983). Further, when the families of disabled children were divided into those served by residential facilities and a genetics screening service, the rate fo divorce in the latter group was significantly lower than the state average.

Marital satisfaction. Studies of measures of marital satisfaction both between diagnostic categories, and in comparison to non-handicapped families are more common than studies of divorce-rate. Some of the contradictory findings apparent in the divorce-rate data are also evident in these investigations. Cummings et al. (1966) found no differences in expressed satisfaction with spouse between mothers of mentally retarded, physically ill, and non-handicapped children. However, using virtually identical methodology a decade later, Cummings (1976) found fathers of mentally retarded children obtained significantly lower scores associated with evaluation of their wives. This author suggests that these lower scores may be a negative backlash reflecting a more pervasive sense of dissatisfaction with family relationships in general. Friedrich and Friedrich (1981) also found significant differences between the parents of mentally handicapped children and a control sample on a marital satisfaction index.

In a comparison of marital satisfaction among Danish and American parents of very young handicapped children, Waisbern (1980) found similar levels of marital satisfaction with controls from those countries. However, upon a closer examination of the interrelationships of variables related to coping and support, this investigator found that greater involvement with the handicapped child might be associated with a higher level of negative feelings towards the marriage.

Contrary to the very high divorce rate reported by Laurence et al. (1977) amongst families with children afflicted with spina bifida, Kazak and Marvin (1984) were struck by the lack of differences in scores on the Marital Stress Index in their comparison of the parents of children with spina bifida and a control group.

Within-group analysis. Analysis of within-group variables associated with marital satisfaction provides further evidence of the complexity of the factors related to family stress. In the study by Roesel and Lawlis (1983) cited earlier, examination of the factors related to risk of divorce revealed complex relationships involving the age of the mother, as well as birth order, and sex of the handicapped child. Increased risk for divorce was associated with an older mother giving birth to a first born male. Friedrich et al. (1987) looked at within-group variables related to marital functioning of 131 mothers of handicapped children. This study found that the child's sex, residence, and problematic behavior, along with maternal depression were significantly related to marital satisfaction. The parents in the sample reported greater satisfaction with their relationship if the child was male, lived at home, and the disability was noticeable at birth. This last factor was felt to be important to the marital relationship because recognition of the handicap at birth permitted the parents time to adjust, and reduced the possibility of ambiguity related to the child's condition.

Finally, there appears to be some evidence of a bidirectional relationship between stress and marital satisfaction in families of handicapped children. Friedrich (1979) examined the relationship between nineteen demographic and psychosocial variables and maternal coping. The results of this investigation indicated that marital satisfaction was the best predictor of maternal coping. While some of the studies cited previously examined marital satisfaction as an outcome variable the Friedrich (1979) study suggests that marital satisfaction might help to mediate the effects of parenting a handicapped child.

In summary, these findings strongly support the notion that marital stability and satisfaction is indirectly related to presence of a handicapped child in the family. Other factors including specific child characteristics, parent characteristics, parents' definition of their situation, and the quality of the spousal relationship need to be considered. The suggestion of a bidirectional relationship between marital adjustment and parental coping behavior also implies that the psychological state of the parent has an impact on the quality of the parent-child relationship.

Effects of Parenting: Parent-Child Interaction

A little studied, but critical aspect of parenting a handicapped child is the relationship between stress and direct measures of parent-child interaction. It has been suggested that direct observation of parent-child interaction provides an indication of the way a family functions, the child's later development, and an association with other measures of family functioning (Comfort, 1988). There is considerable evidence that many child characteristics such as temperament, degree of attachment, and responsiveness are potential sources of stress (Beckman, 1983), and that specific child behaviors are associated with maternal depression (Quine & Pahl, 1984), as well as decreased level of marital satisfaction (Friedrich et al., 1987). Although these studies do not postulate a linear relationship between a child related "cause" and a parent related "effect", they have failed to examine the impact of parental affect and emotional state on parent-child interaction, or attempted to investigate these primary exchanges within a broader social context.

Stress almost certainly affects the caregivers ability to be responsive to the child's communicative behavior. Crnic, Ragozin, Robinson, and Basham, (1983) compared the impact of stress and social support on observational measures of maternal behavior in the families of full and preterm infants. This study found a relationship between self-reported stress and observational ratings of interactive behavior. Mothers who perceived themselves to be under high levels of stress were rated as less sensitive to their infants cues, and also reported less satisfaction with the parenting role. More importantly, measures of maternal stress significantly predicted infant behaviors such as clarity of cues. Correlations between maternal stress and child responsivity to mother's initiations also approached significance. Further, greater responsitivity in both mother and infant were found for those mothers reporting a higher level of social support.

Additional support for the impact of stress on parent-child interaction, specifically involving dyads consisting of a mother and a handicapped child, comes from two exploratory studies. Marcovitch (1985) examined the relationship between tests of self-esteem, well-being, and marital satisfaction, and observational measures of maternal behavior during semistructured play. A significant effect on maternal "style" was found for both self-reported stress, and child diagnosis. Specifically mothers who reported low frustration, those who rated their child's temperament as "easy", as well as the mothers of children with Down Syndrome were observed to be more animated, more vocally appropriate, exhibited more positive affect and choose more appropriate toys.

In a study involving both handicapped and nonhandicapped infants and their mothers, Oster (1985) found a trend in highly stressed mothers from both groups towards decreased responsivity, and a greater degree of rigidity when observed during play, as well as teaching situations. In addition, highly stressed mothers of handicapped children were found to be more directive overall. This study must be viewed with some caution, however, because of the small sample size involved.

Although the evidence is limited, it is possible to draw some tentative conclusions from this body of work. First, the results of these studies support the notion that stress has a significant impact on parent-child interaction. Secondly, the results attest not only to the reciprocal nature of this relationship but also support the hypothesis that such interactions are embedded within a broader social framework. Finally, it appears evident that further studies which utilize larger groups are needed to explore what appears to be a complex and ambiguous relationship.

Characteristics of the Stressor: The Child

As the previous discussion indicates, there is considerable evidence to suggest that conceptualizing stress in families with handicapped children in simple cause and effect terms is misleading. Nevertheless, a number of child characteristics including birth order, sex of the child, child's residence, and a class of variables which may be refered to as "difficulty of care", have received support as important factors which may contribute to family and parental stress.

The study by Roesel and Lawlis (1983), for example, used child characteristics and demographic variables to predict risk of divorce in parents of handicapped children. Birth order was found to be the best predictor of marital instability, and the only one with a main effect. Interaction effects were also noted between birth order and age of the mother. Mothers in their early thirties giving birth to a first-born handicapped child demonstrating the greatest risk for divorce.

Gender. The child's gender also appears to have a contributory effect on parental stress. In a brief review of the literature, Beckman (1983) cited a number of sources that suggested that boys were more stressful than girls. Studies published since that review do not reflect the same degree of consensus. Two recent studies (Frey et al., 1989; Roesel & Lawlis 1983) support the notion that boys are more stressful. These studies suggest that differential responses to male versus female children are related to societal expectations, the presence of more physically handicapping conditions in males, and the risk of paternal rejection when the handicapped child is a boy. Frey et al.(1989), in fact, found that sex of the handicapped child was a significant contributor to paternal stress, but not maternal stress. The dissenting view is provided by Friedrich et al. (1987) who found that female children were more likely to be associated with decreased scores on measures of the quality of family relationships. These investigators attributed the discrepancy between their findings and those of Roesel and Lawlis (1983) to the presence of single parents in the latter study. This explanation seems inadequate, however, since the Frey et al., (1989) study also involved all but one, two-parent families. Other factors such as a wide differences in the mean age of the children and the parents level of education may account for some of the discrepancy in the results of these studies.

Residence. The rationale for institutionalizing a handicapped child has typically involved the suggestion that out-of-home placement reduces parental stress, and enables the family to care more adequately for other children (Tew & Laurence, 1975). It is somewhat surprising then that the three studies examined in this review which addressed this issue found mothers with children in residential settings experienced greater stress (Friedrich, 1979; Friedrich, et al., 1987; Tew & Laurence, 1975). Again, it would be a mistake to draw a simple, linear relationship between institutionalization of children and maternal stress. As Tew and Laurence (1975) indicate, institutionalized children are frequently the most severely handicapped and difficult to care for. It is difficult, therefore, to separate the effects of the child's residence from the severity of the handicapping condition.

Difficulty of care. There is much support in the literature for an association between parental stress and a class of child variables which Beckman (1983) termed "difficulty of care". In her study of handicapped infants, Beckman (1983) found a significant relationship between self-reported stress and observational measures of child temperament, child care demands, and repetitive behaviors. Similarly, several studies utilizing the Parenting Stress Index (Abidin, 1983) have found elevated scores on stress related to child characteristics such as hyperactivity, demandingness, child adaptability, and the child's mood (Cameron, et al., 1989; Kazak & Marvin, 1984; McKinney & Peterson, 1987).

Quine, and Pahl (1985) constructed a "burden of care" score that measured the amount of physical care required by a child. These investigators found that the total amount of care involved in activities such as assistance with meals, toileting, night care, and dressing, were strongly correlated with maternal malaise scores.

If the definition of "burden of care" is broadened to encompass specific behavior problems and lack of communication skill, there is even greater evidence that selected child characteristics contribute to parental stress in a significant way. Behavior problems have been associated with high scores obtained on self-report measures of maternal stress (Bradshaw & Lawton, 1978; Quine & Pahl, 1985), as well as decreased levels of marital satisfaction (Friedrich et al., 1987).

A behavior problem that requires specific mention is night-time disturbance. In a multiple regression analysis, Quine and Pahl (1985) found that night-time disturbances were second only to all other behavior problems combined, in terms of contribution to maternal malaise scores.

Whether the child's lack of communication skills places additional stress on parents of handicapped children is somewhat unclear. Quine and Pahl (1985) did not find a relationship between the malaise score of care-givers, and the child's lack of communication skill. Frey et al., (1989) on the other hand, found that mothers experienced greater stress with children who obtained low scores on the communication scale of the Vineland Adaptive Behavior Scale. It is uncertain why this conflict of findings should arise, although in the former study (Quine & Pahl, 1985) it is implied that communication skill referred to the presence or absence of speech, rather than communication skill per se. Additionally, unlike the earlier study which used school personnel to provide data on skill characteristics, Frey and her associates (1989) utilized the parents as informants. As a result it is conceivable that it is the parent's perception of their child's communication ability that is the critical factor.

Child diagnosis. Diagnostic category has been identified as a factor contributing to parental perceptions of stress (Cummings et al, 1966). However, a number of more recent studies (Bradshaw & Lawton, 1978; Goldberg et al., 1986; McKinney. 1987; Quine & Pahl, 1986) have failed to demonstrate a strong association between child diagnosis and indicators of familial or parental stress. The answer to why such discrepant results should appear in the literature might be apparent in the Goldberg et al. (1986) study. These investigators found no differences in measures of parental distress between parents of children with Down Syndrome and two other diagnostic categories. However, they found that the parents of Down Syndrome children reported higher levels of social support, and access to services. These results suggest that the hypothesized link between stress and diagnosis may be confounded by other factors including social support, and difficulty of care.

Mediating Factors In Stress

As has been implied in the preceding review, the presence of a handicapped child alone, is insufficient to explain the great variability evident in the literature on parental adaptation and family adjustment. It has long been recognized that some families adapt to the presence of a handicapped child with a minimum amount of disruption, while others appear to be devastated by virtually identical stressors (Holt, 1957). It is only recently, however, that researchers have attempted to identify those variables that differentiate between families on the basis of coping (Longo & Bond, 1984; Venters, 1981).

Rabkin and Struening (1976) suggest that factors which appear to mediate an individual's perception of stress may be grouped into three broad categories including: 1) personal factors such as intelligence, verbal skills, morale, personality type, and sense of mastery over one's fate, 2) interpersonal factors, primarily social support; and 3) demographic characteristics such as age, occupation, education, and income (Rabkin & Struening, 1976). Prior to applying these mediating factors to the literature on stress and coping in families with handicapped children, it is necessary to recognize that these factors have cumulative and reciprocal effects. For example, a mother who feels that her handicapped son is not accepted by the other kindergarten mothers, is unlikely to become involved in the school's informal social networks. Similarly, a single mother living on welfare, may feel she has little energy to expend in prescribed developmental activities with her child. In the first example the mother's interpretation of the situation has limited her access to social support, while the single mother's lack of support and material resources may have influenced her sense of mastery and control. Thus it is necessary to keep in mind the interrelated nature of the following factors.

Personal Factors

Rabkin and Struening (1976) stated that it is the individual's perception which "differentiates a stressor from a stimulus and which determines the nature of the stress reaction and the subsequent coping activities" (p1018). The literature dealing with stress and coping in families with handicapped children provides considerable support for this statement. Venters (1981) examined the impact of parenting a child with cystic fibrosis on the adequacy of family functioning. Through self-report and interview data, she was able to order families into three groups according to scores on a family functioning scale. Using a step-wise multiple regression analysis, Venters (1981) failed to find any association between demographic variables and adequacy of functioning, with the exception that all single parent families fell into the low functioning group. More importantly, however, she was able to identify two coping strategies clearly associated with the higher functioning families that she refered to as "sharing the burden", and "endowing the illness with meaning". This latter coping strategy involved the attachment of a positive interpretation to illness-related hardships, as well as defining the illness within a pre-existing religious or scientific framework. Venters suggested that defining their situation both positively, and within a pre-existing framework, allowed these families to use existing resources to buffer the effects of stress.

Locus of control. A psychological process related to situational appraisal, locus of control, has also been the subject of investigations. Locus of control refers to the extent to which an individual believes that he or she can influence the outcome of significant events in their lives. A high degree of perceived control suggests an internal locus, whereas, the belief that an individual can have little impact on life events indicates an external locus of control. In the context of parenting a handicapped child, higher "internality" has been associated with better family relationships (Friedrich et al., 1987), and a heightened sense of maternal competence (McKinney & Peterson, 1987).

In an unexpected finding McKinney and Peterson (1987) found that mothers with a greater sense of control, combined with low spousal support, obtained clinically significant stress scores. This suggests that individuals who feel they can exert considerable control over their situations but perceive themselves as thwarted by inadequate support, experience a high degree of stress. This finding also emphasizes the interrelatedness of cognitive processes and social support.

Parental pessimism. The role of parental pessimism as a mediating variable between a stressor event and parental and family adaptation has also been the subject of study. Rimmerman and Portowicz (1987) found that increases in parental pessimism appeared to strengthen the relationship between parental perspective of child characteristics and parental perspective of child incapacitation. In addition, these writers suggest that parents who viewed their life circumstances as more problematic, also tended to become more pessimistic about their child's abilities and future opportunities.

In her study of the mothers of autistic children, Bristol (1987) found that mothers who blamed themselves, or who defined having a handicapped child as a catastrophe, were rated as adapting less well to their child and received lower ratings on in-home quality of care. Dyson and Fewell (1986) also found that parental pessimism, while not independent of other factors such as child characteristics and social support, was a major source of stress in families of young handicapped children.

Finally, Frey et al. (1989) identified parental beliefs as the single most powerful correlate, contributing significantly to parental distress and family adjustment. These authors concluded that the most effective interventions for stress would involve the development of self-enhancing frames of reference and the cultivation of a greater sense of control.

Demographic Variables

Just as cognitive processes can serve to buffer or exacerbate the effect of a particular stressor, demographic variables can also serve as either a resource, or a liability. Much of the literature that has been written in this area has adopted the view that the presence of a handicapped child in the family is a stress-inducing event. Hence, much effort has been directed towards identifying which demographic characteristics are associated with parental or marital stress. Only recently have investigators begun to recognize these factors as a component of the crisis-meeting resources that families can call upon in the adaptation process (Dunst et al., 1988; Mines, 1988).

A brief examination of the literature suggests that it is important to avoid considering any single demographic factor in isolation. Instead, the evidence indicates that factors such as maternal age, income, education levels have meaning when studied in the context of the other variables discussed elsewhere in this review.

In his study of the relationship of psychosocial and demographic variables to coping behavior, Friedrich (1979) found that none of the demographic characteristics of race, age, education, number of children, religious affiliation and involvement was a significant predictor of maternal coping behavior. A variable not included in the Friedrich (1979) study was the number of parents in the family. It seems to make intuitive sense that two-parent families would have an advantage over single-parent families in terms of resources. Beckman (1983) found that number of parents was the only demographic variable related to stress in families with young handicapped children, other researchers have confirmed this result (Quine, & Pahl, 1983; Venters, 1981).

Financial resources. Financial resources seem to have an indirect relationship to stress in families with handicapped children. Mines (1988) found, not surprisingly, that the Financial Stress subscale of the Questionnaire for Resources and Stress (QRS; Holyroyd, 1974) was predicted by socioeconomic status, type of handicap and marital status.

Dunst et al. (1988) examined factors which predicted commitment to child-level interventions with handicapped infants. Family income was found to be weakly related to the implementation of child-level interventions.

Maternal age. There is some evidence that maternal age has an effect on parental perception of stress. Ragozin, Bashen, Crnic, Greenberg and Robinson (1982) in a study of preterm infants noted that satisfaction with the maternal role tended to increase with the age of the mother. As mentioned previously, Roesel and Lawlis (1983) found that the interaction of maternal age with other factors such as the sex of the handicapped child and birth order predicted risk of divorce.

Level of adversity. The Roesel and Lawlis (1983) study demonstrates how demographic variables are embedded in complex interrelationships with other factors. Additional evidence of the interrelatedness of these variables is provided by Quine and Pahl (1986). These authors constructed an Adversity Scale which cumulated the effects of unemployment, parental disability, illness, financial concerns, isolation, and poor housing. Total score on the Adversity Scale was strongly and positively correlated with a measure of maternal malaise.

The study by Quine and Pahl (1983), as well as that of Roesel and Lawlis (1983) support the notion that it is aggregated, rather than isolated, stressors that have a significant impact on parental well-being and family functioning. These stresses involve the characteristics of the child, as well as demographic and socioeconomic factors which are mediated, in turn, by the cognitive processes of the individual. A final, external factor needs to be considered. This factor is the network of social support that surrounds the individual and their family.

Social Support

The role of social support in the adaptation of families with a handicapped child has been the subject of considerable investigation. Social support may be seen as a resource, related to personal forms of coping in a multidimensional fashion. As a resource social support is thought to enhance personal coping by providing emotional mastery and guidance towards problem-solving strategies, and feedback on performance (Kazak & Marvin, 1984), as well as through the attenuation of threat associated with situational appraisals (Schilling, et al., 1984).

Dunst et al. (1986) employed the human ecology theories of Bronfenbrenner (1979) to provide a framework for understanding the dynamics of social support. This framework can be conceived as a series of concentric circles, each circle representing a different layer, or level of social support. The inner most ring involves the developing child and their family. Each additional ring adds another level of support, moving from the nuclear family out towards the larger community and beyond. Since these circles are interrelated, changes in one reverberate throughout the system.

The role of social support as an effective mediator of stress is strongly supported by the literature. Positive effects of social support are typically reported in terms of parental outcomes such as self-report measures of stress, and psychological state. These outcomes include lower levels of self-reported depression (Dunst et al., 1988; McKinney & Peterson, 1987), and decreased scores on stress measures (Mines, 1988). While Dunst et al., (1986) found that social support had a greater impact on personal coping than family integration, a more recent study suggests a positive relationship between social support and marital adjustment (Friedrich et al., 1987).

Consistent with Bronfenbrenner's theories of human ecology, Dunst and his associates have found evidence that social support may have indirect or "second order" effects on the child. Informal sources of social support, in combination with financial solvency, were found to be a significant predictor of parental commitment to child-level interventions (Dunst et al., 1988). Developmental growth, as measured by periodic assessment on one of several standardized measures, was also shown to be significantly related to the number of sources of support available to these families (Dunst et al., 1986). In the same study, these investigators found that the amount of social support influenced parents' perception of child characteristics. Parents who reported having more supportive networks indicated greater social acceptance of their children, as well as fewer behavior problems and physical limitations.

Network size and density. The concepts of network size and network density are important elements of the literature in this area. Network size simply involves the numbers of people offering the type of support discussed previously, network density on the other hand, refers to the extent to which the individuals in the network know each other (Kazak & Marvin, 1984). Within the field of social network analysis, it is felt that larger social networks are associated with the greater likelihood of successful coping. Complimenting a larger network of supports, networks which are less dense are believed to provide the individual with greater diversity of coping strategies (Kazak & Marvin, 1984).

Some of the early literature suggests that families with handicapped children tend to experience a greater degree of social isolation (Holt, 1956; Marcus, 1977). In their study of children with spina bifida, Kazak and Marvin (1984) found that the parents reported smaller, denser social support networks, made up disproportionately of family members. However, since the size of the network was unrelated to a measure of parental stress, these authors suggested that the network was effective, given the circumstances of the family. Other investigators have found that while there are few difference in terms of network size between the families of handicapped and non-handicapped children, parents of handicapped children tend to report more contact with professionals, hospitals, and other care providers (Waisbern, 1980), and that outside helpers comprise a significant component of these networks (Dyson & Fewell, 1986)

Type of social support. Finally, there is some evidence that the type of support available to families of handicapped children has a significant impact on stress. In a brief review of the literature, Kazak and Marvin (1984) suggested that it was informal, rather than formal support that is critical to family adaptation. Certainly the evidence for the importance of spousal support as a mediator of parental perception of stress is impressive. In a frequently cited reference, Friedrich (1979) reported that the mother feeling secure within the relationship accounted for 79% of the predictive validity with a measure of parental coping. A number of additional investigations have confirmed the finding that spousal and other forms of intrafamilial support is a critical factor in maternal depression and perceptions of stress (Friedrich, Wilturner, & Cohen, 1985; McKinney & Peterson, 1987; Waisbern, 1980).

The role of formal sources of support in the mediation of stress in families with handicapped children is less clear. Waisbern (1980) found few differences between the Danish and American families in the degree of satisfaction with support services, despite the availability of comprehensive and freely available services in Denmark. Further, this author failed to find a significant correlation between use of outside services and parental coping. In a study involving a two by two factorial design, McKinney and Peterson (1987) looked at the impact of group versus individual intervention on parents of children with either Down Syndrome or cerebral palsy. No relationship between type of intervention and maternal stress was found. McKinney and Peterson (1987) did note, however, that over half the participants identified peer support as an important component of the intervention.

There is evidence that greater utilization of formal supports are indicative of higher levels of stress. For example, Dunst et al, (1986) found that families which have sufficient informal sources of support tend to reduce their dependency on professional services. Mines (1988) found that the more support parents obtain from clergy and church affiliation, as well as professional services, the greater the stress they reported. Together these studies suggest that isolated families may have to reach beyond the inner most circle of family and friends to institutional sources of support including professionals and clergy.

Summary of the Literature on Stress and Coping

The preceding review of the literature provides clear evidence that stress in families with handicapped children is a multidimensional phenomena. Although much of the literature on stress and coping in families with handicapped children has been criticized as being simplistic, unidimensional, and occasionally contradictory (Crnic et al.,1983; Longo & Bond, 1984) some generalizations may be drawn from this body of work. It is apparent that adaptation of a parent or family to the presence of a handicapped child is dependent upon a complex set of factors related to child characteristics, parental characteristics and the supporting social structure. In addition, the undesirable effects associated with parenting a handicapped child appear to be potential rather than inevitable. Finally it seems that families are not completely passive in their response to a crises. As the Venter's (1981) study suggests, families have a number of strategies that can be actively employed to help the system adapt, and function in the face of stress.

Multidimensional Approaches

In the face of the complexities, described above researchers in this area have searched for "conceptual models capable of integrating the disparate findings in the literature into a coherent whole that is greater than the sum of its parts" (Belsky, 1984, p. 83). To this end, researchers have employed the cognitive coping model of Lazarus (as cited in Friedrich, et al.,1985; 1987) which emphasizes the role of cognitive appraisal in the mobilization of coping resources. Other investigators have employed models borrowed from the field of family studies in their investigations of the impact of parenting a handicapped child. Mines (1988) utilized Hill's (1958) ABCX model which examines the nature of the stressor event, crisis meeting resources, and the families appraisal of their situation in explaining the family's response to stress and crisis. Bristol (1987) used Patterson and McCubbin's (1983) elaboration of the ABCX model which attempts to account for family adaptation to a crisis over time, in a study of the impact of parenting an autistic child on measures of maternal well-being. It is this latter model which was used in the design of the intervention project under present consideration. This framework, called the T-Double ABCX Model, will be described briefly before examining the literature on intervention.

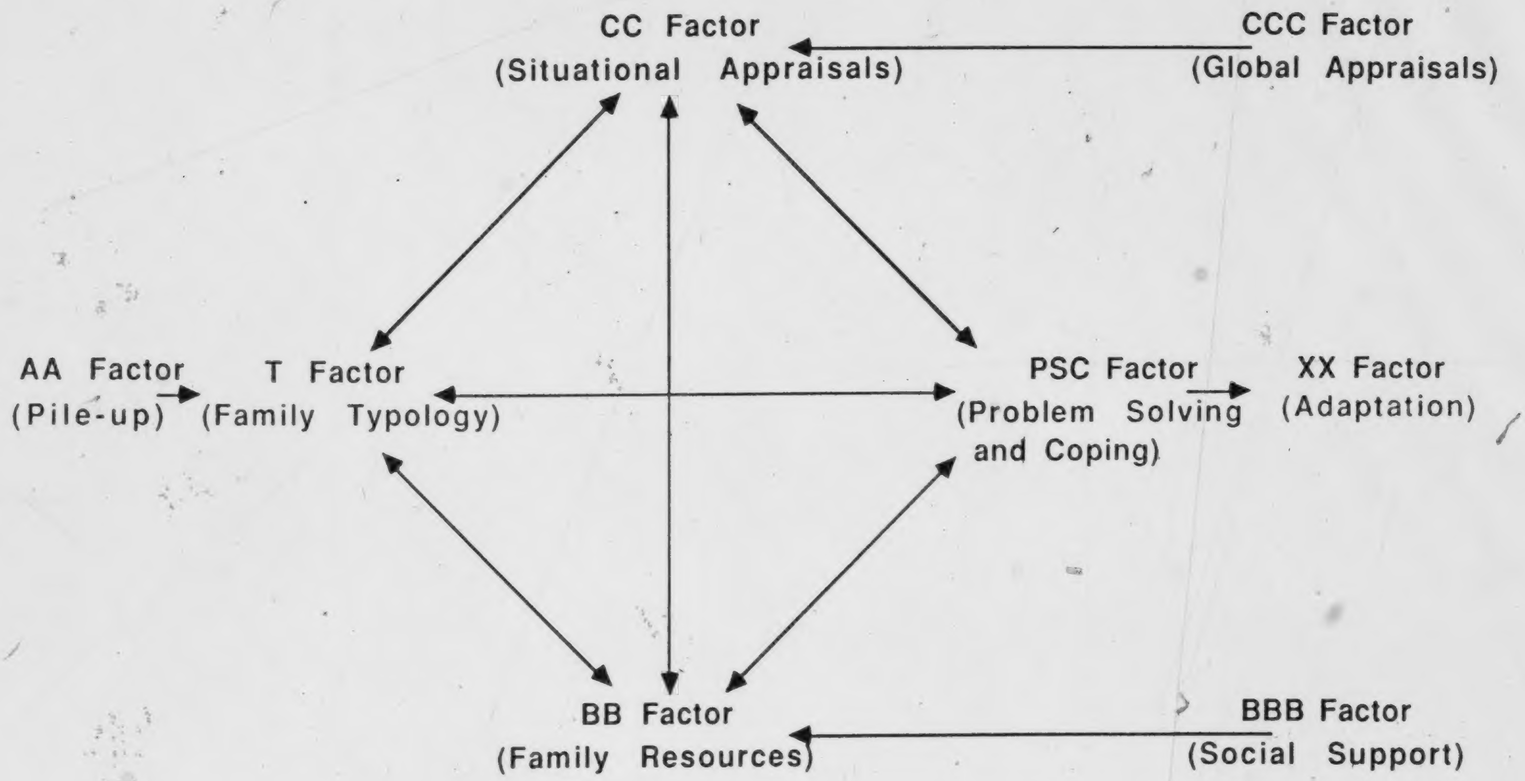
The T-Double ABCX Model

One theoretical framework that attempts to take into account the multiplicity of factors that contribute to adaptive functioning has been proposed by Patterson and McCubbin (1983). The T-Double ABCX Model postulates that a family's adaptation to a potential stressor is a product of a number of interrelated factors including, the pileup of stressors, family type, situational appraisals, family and community resources, as well as the family's problem-solving and coping skills. Each of these factors interact in a dynamic fashion to determine the family's level of adaptive functioning in response to a chronic stressor (McCubbin & Thompson, 1987). This framework is represented in Figure 1.

The AA Factor. In the McCubbin/Hill model the AA factor, or pile-up of stressors, refers to the sum total of stresses and strains associated with a family's response and adaptation to a crises (McCubbin & Patterson, 1981). Within this framework a stressor would be defined as an "event or state that arises from a demand-capability imbalance in the family's functioning" (Wikler,1986). The inclusive nature of this definition is important since it takes into account not only those factors which are directly related the child, but also the additional stressors common to families without a

FIGURE 1

Modified T-Double ABCX Model



ADAPTED FROM McCUBBIN AND THOMPSON (1987) delayed or disabled child. In the context of parenting a handicapped child, this would include child-related factors such as severity of the handicap, care-giving demands, presence of behavior problems, dealing with professionals, and a lack of child responsiveness. To these potential stressors would be added the factors contained in the "Adversity Scale" described by Quine and Pahl (1985) including, parental disability, marital discord, poor housing, money worries and other factors which may be indirectly, or unrelated to the child. Finally, the AA factor also includes stress associated with normative changes such as school entrance, a spouse returning to work, death of a grandparent and other transitions that all families endure. The AA factor then recognizes that a handicapped child enters a family system that has stressors that predate, and occur simultaneous to, the presence of that child.

The BB Factor. The BB factor, or family resources, refers to a complex set of psychological, social, interpersonal and material resources that enable the system to maintain integrity, and function in the face of a crisis (Patterson, & McCubbin, 1983). A number of these relevant personal/psychological resources can be gleaned from the literature on stress including intelligence, verbal skills, income, morale, locus of control, and self-esteem (Rabkin, & Struening, 1976).

Family resources are more qualitative and difficult to measure. The family resources that McCubbin, and his associates felt were most directly related to coping included the family's adaptability, and degree of cohesion, (McCubbin & Thompson, 1987). Finally, "community" in the broadest sense contributes to the families efforts to cope. As repeatedly identified in the preceding review, social support, particularly from within the nuclear family, as well as extended family members, close friends, and to a lesser extent parent groups and professional organizations appears to be positively related to adaptive coping.

CC Factor. Wikler (1986) described Hill's (1949) original formulation of the C factor as "the degree to which the situation (immediate crisis) is seen by the family as a threat to family status, family goals, or family objectives" (p. 171). In the T-Double ABCX model this definition has been expanded to encompass the way the family appraises not only the event that precipitated the crisis, but also their total situation including related and unrelated stressors, as well as crisis meeting resources, over time (Patterson, & McCubbin, 1983).

Appraisal is an ongoing process that occurs at many levels. Appraisal involves the way a family defines a specific situation or stressor (appraisal of the specific stressor event), the family's assessment of their capability to deal with that stressor (situational appraisal), and finally the general set of beliefs or assumptions each of the family members has about each other, as well as their relationship to the community at large (global appraisal).

The evidence supporting the role of appraisal as a mediator of stress is substantial and has been outlined elsewhere, however, an example of appraisal as an adaptive response may be illustrative. As Venters (1981) noted in her study of families with chronically ill children, one of the strategies utilized by " successful" families was to define the illness within a preexisting belief system. Appraising the illness as "an act of God", or an "opportunity to grow" appeared to assist the family to carry on in the face of a potentially devastating situation.

PSC Factor. Just as there is variation in the extent to which individuals can deal effectively with seemingly identical stressors, families also vary in their ability to cope with a crisis of similar magnitude. To some extent these differences may be accounted for by the system's cumulative ability to use existing resources to deal effectively with a chronic stressor. The PSC factor in the T-Double ABCX Model refers to the family's unique set of problem solving and coping strategies.

Coping is a response to the pile-up of demands on a family. It involves the mobilization and interaction of resources, perceptions, and behavioral responses. McCubbin and his associates view coping as the "central process describing families efforts to adapt and achieve a new level of organization or balance in their system" (Patterson, & McCubbin, 1983, p.28). Dominant forms of family coping skills include; 1) direct action to reduce demands, 2) direct action to acquire additional resources, 3) maintenance of exsisting resources 4) managing tension, and 5) appraising the meaning of a situation in a more favorable light (McCubbin & Thompson, 1987 p. 222). In their study of stress and marital satisfaction, Kazak and Marvin (1984) suggested that families with handicapped children adopted a different, but functional role structure, in which the provider and caregiving roles were sharply divided. This reorganization of the family structure may be seen as an expression of most of the forms of coping described above.

T-Factor. Within the T-Double ABCX model families are seen to function according to discernable and predictable patterns of behavior. McCubbin and Thompson (1987) suggest that these patterns permit the researcher to categorized the families into types which they define as "the way a family system typically appraises, operates, and/or behaves" (p. 5). These pervasive patterns have important implications for the study of stress in families of handicapped children. It has been suggested that families that are able to maintain a balance between individual and family needs, as well the needs of the family and community, are better able to deal with stresses related to both normative transitions, and those associated with parenting a chronically ill child (Patterson & McCubbin,1983; McCubbin & Thompson, 1987). Unfortunately neither the study presented here, nor those discussed throughout this review have included measures of family type.

XX Factor. Each of the factors in the McCubbin model interacts in a dynamic fashion to determine the family's level of adaptive functioning in the face of stress. The product of this interaction is the XX factor, or family adaptation. Successful adaptation occurs when the system maintains a balance between the demands of a situation and the collective capabilities of the system. Adding stresses to the Pile-up (factor AA) necessitates increasing family resources (factor BB), reappraising the situation (factor CC), and/or enhancing problem solving and coping skills (PSC) to insure that the needs of individual family members are met and the system adapts to the crises.

Achieving a balance between the demands on a family and the resources that may be marshalled to meet those demands results in what McCubbin and Patterson (1983) refer to as "bonadaption", or a state of equilibrium within the family, and in the family's relationship with the broader community. An imbalance in the demand-capability equation results in maladaption or distress. Within this framework the deleterious effects attributed to the presence of a handicapped child, such as parental malaise, marital discord, and disturbed parent-child relationships, are seen as evidence of a systemic imbalance.

The T-Double ABCX Model provides a framework that might help to explain some of the ambiguities in the literature on family adaptation to the presence of a handicapped child. Under this model the child is only one component in a series of interrelated subsystems including parent-child, spouse-spouse, child-sibling, family to community and so forth. The model takes into account many of the variables that emerge in the literature and offers a degree of integration to these seemingly "disparate elements". While the T-Double ABCX Model has been used primarily for its heuristic value (Wikler, 1986), a few studies have employed the Hill/McCubbin model as a framework for studies into the effects of parenting a handicapped child.

Support for the T-Double ABCX Model

Support for the utility of the Hill/McCubbin Model in understanding the impact of a handicapped child on the family has been provided by a number of relatively recent studies. McCubbin and Patterson (1981) used the Double ABCX model to discriminate between "balanced" and "unbalanced" families with children diagnosed as having cerebral palsy. Using the Family Adaptability and Cohesion Scale (FACES) as a measure of balance these authors found that families could be discriminated into discrete groups on the basis of measures of pile-up and parental coping. Classification accuracy based on these two discriminators was reported to be 70% (McCubbin & Patterson, 1981 p.16). The results suggested that "balanced" families experienced a higher level of life changes (AA factor) in response to parenting a handicapped child, while demonstrating a greater degree of family integration, social and medical support (McCubbin & Patterson 1981).

In a more recent study Bristol (1987) used the Double ABCX Model to predict successful adaptation in mothers of severely communication impaired and autistic children. Family adaptation was determined through measures of depression, marital adjustment, and quality of parenting. These measures of family adaptation were positively predicted by the adequacy of social support (BBB Factor) and active coping patterns (PSC Factor). Poor adaptation, on the other hand, was predicted by maternal pessimism (CCC Factor) and the pile-up of family stresses (AA Factor).

Unlike McCubbin and Patterson (1981), Bristol (1987) found that the pile-up of stressors was associated with maternal maladaption, rather than adaptation. Pile-up of life stresses in the Bristol study was linked to marital discontent, increased maternal depression, and decreased quality of parenting (Bristol, 1987). Some of the apparent contradictions between these two studies may be resolved by examining differences in the samples, as well as the outcome measures. In the McCubbin and Patterson study, discrimination between balanced and unbalanced families was made on the basis of a measure of family adaptability and cohesion, completed jointly by both mother and father. In contrast, Bristol used the Double ABCX model to predict measures of psychological well-being and marital satisfaction completed by mothers alone. Both investigations used a measure of recent life changes as a measure of pile-up, however, the Bristol (1987) study also included the severity of the child's handicapping condition, and examined the extent to which life changes limited opportunities for individual and family growth. It is likely that the inclusion of measures of parental appraisal and child characteristics in the pile-up of stressors produces a better predictor of maternal depression. This explanation for the discrepancy in results seems particularly plausible given the level of literature support for the notion that maintaining the family under the stesses and strains of raising a handicapped child exacts a greater toll on the mother.

Mines (1988) used Hill's original ABCX model to investigate the role of internal and external family resources and the characteristics of the child in the prediction of stress in mothers of children with mild to severe levels of retardation. The results of this study provided mixed support for the ABCX model. Child characteristics and resources emerged together as significant predictors of stress associated with limits on family opportunities, life-span care, financial solvency, and personal burden. In other analyses, however, these variables appeared to have unique associations with other forms of stress. Mines (1988) suggested that while the ABCX model provided a useful framework for the study of stress and coping, a more complex model was needed to understand the multidimensional nature of this relationship. To this end the author recommended the Double ABCX Model as a framework that could provide a more comprehensive analysis of the processes involved.

The final investigation to be considered in this section utilized most of the measures employed in the present study. Reddon (1989) examined patterns of stress and support in the mothers and fathers of sixteen handicapped preschool children. Using the Double ABCX model as a framework this author investigated the relationship of the pile-up of stressors, as well as family system resources and supports to a measure of family adaptation. A direct relationship was found between the number and severity of life stresses, and measures of personal and family functioning for both mothers and fathers in the sample. This finding tends to confirm the results of previous studies (Bristol, 1987; Quine & Pahl, 1985) that indicated that family functioning and parental well-being are related to a total stress factor, including child factors as well as other life stresses. Further, the regression analysis provided strong support for the contribution of parental coping strategies and resources, particularly social support, to family adaptation.

The Reddon (1989) investigation was somewhat limited by the fact that it failed to include specific measures of family type or appraisal. This study, however, when considered together with the work by Bristol (1987) provides considerable support for the McCubbin et al. (1987) model as a vehicle for understanding the role of stress and supports in families with handicapped children.

The T-Double ABCX Model was used in the design of the multidimensional intervention project which is the concern of the present investigation. Prior to a discussion of the methods and results of that study it is necessary to provide a brief overview of previous intervention attempts. This component of the review will examine the literature related to two forms of interventions: those that have sought to alter parent-child interaction patterns, and studies that have focused on enhancement of parental coping strategies and stress management training.

Intervention Studies

The research on stress and coping in families with handicapped children has given rise to a number of recommendations for clinical practice and direct intervention. Not surprisingly, increasing the level of social support is perhaps the recommendation most frequently given (Bristol, 1987; Friedrich & Friedrich, 1981; Gallagher et al., 1983). Alternative approaches to alleviating stress in families with handicapped children include increasing coping strategies and modifying subjective beliefs (Bristol, 1987; Frey, et al., 1989), anticipatory guidance (Longo & Bond, 1984), helping mothers identify specific child variables that induce stress (Kazak & Marvin,1984), recruiting extended family members to assist with care (Dyson,1987), more extensive systems of respite care (Gallagher et al., 1983), and counselling aimed at developing positive family relationships and skills for efficient operation of daily activities (Dyson, 1987).

A recommendation particularly relevant to the present study was put forth by Mines (1988). She suggested that research findings related to the contributions of child characteristics and family resources called for a multidimensional approach to clinical practice with the families of handicapped children.

Coping Skills and Stress Management Training

Despite a wealth of recommendations there have been few empirical studies designed to evaluate the effects of intervention on parental perceptions of perceived stress (Singer, 1988). Investigators in this area have frequently relied on a clinical approach, using impressionistic data to validate their efforts. For example, Shilling et al. (1984), reported on the use of group training sessions to increase personal coping skills, and build social support. The focus of these sessions was to help parents build their own social support networks, develop realistic self appraisals, and improve communication skills. While objective data were lacking, parental self reports and clinical impressions suggested a beneficial effect. Impressionistic data was also used to support the effectiveness of a stress intervention program in which parents of handicapped children were taught self-talk analysis and relaxation techniques in a setting designed to facilitate social support (Peterson, 1982).

Intagliata and Doyle (1984) described a pilot study aimed at enhancing the coping resources of a small group of parents of handicapped children. The program was designed to enhance interpersonal problem-solving skills. The authors concluded that training improved the parents' ability to generate relevant means in the solution of hypothetical problems, however, they emphasized the tentative nature of the results.

Two recent intervention studies have employed experimental, or quasi-experimental designs in an effort to objectively evaluate treatment effect. Kirkham, Shilling, Norelius, and Schinke, (1986) used a pretest and post-test design to study the effect of group training involving a number of coping strategies on measures of parental perceptions of stress, child characteristics, quality of life and social support with four mothers of handicapped children. The strategies taught involved interpersonal communication, cognitive reframing, problem solving, and social support enhancement. Improvement was noted on all measures for three out of the four subjects. The investigators also reported that the participants were able to demonstrate the specific skills taught within the treatment setting and that homework assignments indicated that these skills were being applied in a variety of situations. However, small sample size, absence of controls, and the lack of observational data limits the generalizability, as well as the internal validity of the results.

In what is likely the most carefully designed study of this type, Singer (1988) attempted to empirically validate the effectiveness of teaching a variety of self management skills to parents of handicapped children. Using parents on a waiting list as controls, this researcher investigated the effect of group training in techniques including relaxation training, self-monitoring of stressful events, and cognitive modification on measures of anxiety and depression.

Singer reported that training resulted in a significant difference in self-reported trait and state anxiety for the experimental group. Although no significant main effects were found on the depression index, results suggested depression rates, which had been higher for the experimental group, declined on post-test, whereas the opposite held true for the control group. Social validation data indicated that listening to the group leaders talks on stress, respite care enabling the participants to attend the sessions, and sharing concerns with other parents of handicapped children were rated as the most helpful components of the intervention.

The Singer study examined the effect of self-management training in terms of global measures of stress, anxiety, and depression. While promising, without specific measures of well-defined outcome variables, it is difficult to determine if any single component of the treatment did what it was purported to do. There is much evidence in the literature that social support buffers the perception of stress. Simple membership in a group that focuses on relevant issues could, in itself, account for treatment effects. This suggests that there is a need to determine the relative merits of specific treatments by incorporating measures reflecting the multidimensional nature of stress and coping in families with handicapped children

Enhancing Parent Child-Interactions

The parent-child interaction process has only recently been studied in relation to stress and coping in families with handicapped children. There is, however, a substantial body of research documenting differences in interaction patterns between a parent and a handicapped child, compared to a parent and a normally developing child. An extensive review of the literature related to interaction patterns between parents and their handicapped child was provided by Mitchell (1987). He found that while the results of studies involving handicapped children and controls matched for mental age were somewhat equivocal, interaction involving handicapped children and their caregivers could generally be described as asynchronous. The pattern he described involved an intrusive parent, and a passive and difficult to read child. Support for this pattern may be found in a study by Marfo and Kysela (1988), which suggests that handicapped children demonstrate significantly fewer positive expressions than their non-handicapped, M.A. matched peers. In addition, mothers of handicapped children were found to give more instructions and dominate the exchanges with their child to a greater extent than did mothers of non-handicapped children.

In a longitudinal study, Berger and Cunningham (1983) found that distortions in the interactive process were evident in Down Syndrome children and their mothers, by the child's sixth month. The results of this study also indicated that this imbalance tended to increase with the age of the child. Agreement with these findings can be found in a series of studies reported by Mahoney (1988). In comparisons of interactional patterns between nonhandicapped and handicapped mother-child dyads, mothers of Down Syndrome children were found to use up to 900% more requests (Mahoney, 1988). In addition, these mothers tended to use requests that were at the high end of their child's developmental competence compared with the non-handicapped group. Within the handicapped group mothers who were rated high in child orientation and enjoyment but low in directiveness, had children at higher levels of developmental functioning, suggesting a link between interactional style and developmental competence.

Mitchell (1987) refered to the pattern of dysfunctional interaction noted in these studies as a "cumulative deficit phenomena"(p. 77). This pattern can be conceptualized as a cycle in which the parent escalates their directiveness in an attempt to optimize the child's communicative behavior, while the child, in response to this intrusiveness becomes increasingly more passive. According to Mitchell, this cycle may have far reaching effects for both partners, including an exacerbation of the child's social-communicative development and a threat to the parents feelings of competence.

There is some evidence that interventions can disrupt this cycle and have a positive effect on parent-child interaction. Dyads consisting of handicapped preschoolers and their mothers involved in an intervention program were found to demonstrate significantly higher levels of reciprocal visual regard and smiling compared to similar mother-child pairs not involved in the program (Marfo & Kysela 1988). Although this may be seen as an incidental effect of content-focused programs, intervention is increasingly centered on improving the quality of the parent-child interaction process. Brown-Gorton and Wolery (1988), for example, used a multiple baseline design, to study the impact of teaching mothers to imitate their child on the interaction pattern of three mothers and their young handicapped children. The results of this investigation suggested that use of directives or "mands" covaried with parental use of imitation. Not only did the mothers engage in more imitation with their children following intervention, parental use of "mands" declined markedly. Rosenberg and Robinson (l985) provided training in the use of interaction strategies to a group of 16 mothers of mild to severely handicapped pre-school children. The strategies were aimed at increasing the mothers responsivity to their child's interests and moods, as well as matching parental expectations to the developmental levels of the children. The investigators reported gains on measures of child interest, as well as teaching skills.

Approaches based on increasing parents' responsiveness to their child's communicative behavior and developing joint interaction routines are best exemplified by the work of James MacDonald and his associates. The goal of this approach is to "allow the child's communicative potential to emerge through restructuring interactive roles" (MacDonald & Gilette, 1988, p.222). Parents are encouraged to replace interactions that are didactic, or directive, with strategies involving reciprocal turn-taking, appropriate modelling and matching the child's level of communication (MacDonald & Gilette, 1988).

Mahoney (1988) incorporated the strategies of turn-taking, and interactional matching in an intervention study involving 34 handicapped children and their mothers. A number of significant changes were noted in the parents' interactional style following intervention. A general effect of increased communicative responsiveness and reduced directiveness was noted across groups. The children of parents rated low in directiveness made the greatest gains in terms of developmental and language age scores (Mahoney,1988). Finally, those parents who were most effective in implementing the strategies also received the highest ratings on the Maternal Behavior Rating Scale on measures related to enjoyment of children, appropriateness of stimulation, and sensitivity to the child's state. Additional support for the effectiveness of training programs incorporating the elements of turn-taking, and interactional match is provided by Girolametto (1988). Mothers who received training demonstrated higher levels of contingent responsiveness, used fewer redirections, and maintained child-initiated topics longer, compared to a control group

Although the studies described above suggest that adopting a responsive, reciprocal approach to interacting with a handicapped child results in more effective interaction and a greater enjoyment of these exchanges, the impact of altering parent-child interaction on parental stress has not been studied directly.

Summary of the Literature

Despite the presence of ambiguous and occasionally contradictory results, empirical studies generally support the clinical impression that the presence of a handicapped child places additional demands on the family system. The finding of differential outcomes for fathers versus mothers, as well as the variability in the coping capabilities demonstrated by families suggests that the relationship between stress and parenting a handicapped child is nonlinear.

Significant associations have also been documented between stress and child characteristics such as birth order, behavior problems, gender, and care-giving demands. However, the evidence presented in this review indicates that the relationship between the stressor event, in this case the handicapped child, and the family's response to that stress is mediated by a number of factors.

This literature suggests that characteristics of the parents including age and socioeconomic status appear to be significant variables. In addition, there is evidence that cognitive processes such as locus of control, as well as situational and global appraisals serve important mediational functions.

Finally, the external factor of social support, particularly support from intrafamilial sources, has shown a strong and positive relationship to a number of parent and child outcome measures. Further these factors appear to have both direct and interactive effects.

The complexities apparent in this literature indicate a need for multidimensional frameworks to accommodate and structure these findings. The T-Double ABCX Model is one such framework that appears to hold promise in broadening our understanding of the processes involved in parenting a handicapped child. This model postulates that a family's response to a chronic stressor is determined by the interrelationship of a number of critical factors including the pile-up of stressors (AA Factor), family type (T Factor), family and community resources including social support, situational appraisals (CC Factor), as well as the family's problem-solving and coping resources (PSC Factor). Within this framework the stresses associated with parenting a handicapped child result from an imbalance between the demands produced by a pile-up of stressors and the crisis meeting resources of the family.

The McCubbin/Hill model can also be used to understand the functions of the intervention efforts described in this review. To date, intervention attempts relevant to family adaptation have taken two forms. One type of intervention related to stress and coping involves buttressing the parents' crisis-meeting resources through training in stress management techniques and problem-solving skills, as well as enhancement of social networks. Support for the effectiveness of training in problem-solving skills and social support enhancement comes primarily from impressionistic data. There is, however, some empirical evidence that stress management training reduces parental anxiety and depression.

The second form of intervention involves modification of the parent-child interaction process. While the connection between this type of intervention and parental coping may not be immediately obvious, improving the quality of interaction could reasonably be assumed to enhance feelings of competency and increase both learned and self generated problem-solving skills (PSC), while reducing stress related to child characteristics (AA factor). This review presented evidence that training in interactional strategies improves parental responsiveness and promotes the social-communicative development of handicapped children. The effect of this type of intervention on parental perceptions of stress, however,has not been systematically explored.

Chapter 3

RATIONALE AND RESEARCH QUESTIONS

Introduction

As highlighted in the preceding chapter, the evidence strongly suggests that parents of handicapped children experience higher levels of stress when compared to the families of non-handicapped children. Further, the literature indicates that this stress may have a significant impact on the psychological well-being of the parent, feelings of satisfaction with the marital relationship, and the quality of parent-child interaction.

The utilization of multidimensional models of stress and coping have led to the identification of numerous factors, and relationships between factors, that appear to determine the family's adaptation to the presence of a handicapped child. Of particular relevance to the present investigation is the work of Reddon (1989) who used the T-Double ABCX Model to examine patterns of stress, coping and resources in the families of handicapped preschool children. While these efforts have given rise to a number of recommendations for clinical practice, there is a clear need to empirically validate both the utility of the models and the effectiveness of interventions directed at the reduction of stress and the enhancement of parental coping skills.

The present investigation was undertaken for two main purposes. Measures related to the T-Double ABCX Model were used to determine if a common pattern of stress, coping and resources was evident in two samples of families with handicapped preschool children. The second purpose of the study was to evaluate the effectiveness of two interventions designed to enhance parental coping and reduce stress. A discussion of the rationale and specific research questions related to each of the components of this study follows.

Between Group Comparisons on Measures of Stress and Coping

The T-Double ABCX Model postulates that a family's adaptation to a potential stressor is a product of a number of interrelated factors including the pile-up of stressors, family type, situational appraisals, family and community resources, as well as the family's problem-solving and coping skills. In the present study, measures related to this model were administered to parents of handicapped children attending early intervention programs. These data were used in a series of comparisons with the results of the prior study by Reddon (1989) and normative data where available. These comparisons were carried out to further validate the results of that study, and to determine if parents in the present investigation differed significantly from their counterparts in the Reddon (1989) study along any of the commonly measured dimensions of the T-Double ABCX Model.

The following research questions are intended to reveal similarities and differences between these two samples along five of the dimensions of the T-Double ABCX Model. Consistent with the Reddon (1989) study the questions begin with mother/father comparisons within the sample

Research Question 1 (AA Factor)

a. Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences on measures of perceived stressors, or Pile-Up?

b. Do parents of young handicapped children who express an interest in becoming involved in stress intervention, differ significantly from a similar group of parents not involved in intervention, on measures of Pile-Up?

Research Question 2 (BB Factor)

a. Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences on measures of resources perceived to be available to the family?

b. Do parents of young handicapped children who express an interest in becoming involved in stress intervention, differ significantly from a similar group of parents not involved in intervention, on measures of resources perceived to be avaliable to their families?

Research Question 3 (BBB Factor)

a. Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences on measures of social support believed to be available to them?

b. Do parents of young handicapped children who express an interest in becoming involved in stress intervention, differ significantly from a similar group of parents not involved in intervention, in the amount of social support perceived to be available to them?

Research Question 4 (PSC Factor)

a. Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences in their perception of coping behaviors they employ to manage family life ?

b. Do the parents of young handicapped children who express an interest in becoming involved in stress intervention, differ significantly from a similar group of parents not involved in intervention, in their perception of coping behaviors they employ to manage family life?

Research Question 5 (CC Factor)

Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences on measures of beliefs related to child development?

Research Question 6 (XX Factor)

a. Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences on a measure of family adaptation?

b. Do parents of young handicapped children who express an interest in participating in stress intervention, differ significantly from a similar group of parents not involved in intervention on measures of family adaptation?

Stress Management Training

Six sessions dealing with stress management training were presented to groups of parents of handicapped children over a period of five to six weeks. In the present investigation stress management training consisted of three coping strategies including cognitive reframing, progressive relaxation and social support. Cognitive reframing has been used to treat a variety of stress and anxiety related disorders (Miechenbaum & Deffenbacher, 1988), while progressive relaxation has proven to be effective in the treatment of somatic disorders and chronic anxiety (Stoya & Anderson, 1982). The quality and quantity of social support has been linked to psychological well-being (Dunst et al., 1988), marital satisfaction (Friedrich, et al., 1987), and even the developmental growth of the child (Dunst, et al., 1986).

Stress management training could be predicted to reduce the pile-up of stressors (AA Factor) through the enhancement of parental coping and problem-solving skills (PSC Factor), the bolstering of family resources particularly social support (BBB Factor), and the facilitation of a positive interpretation of events(CC Factor).

The following research question was designed to evaluate whether stress management training resulted in the predicted outcomes.

Research Question 7

a. What is the effect, if any, of group intervention involving stress management training on measures of Pile Ups, Social Support, Personal Coping Skills, and Family Resources and beliefs held by parents of handicapped children about child development?

Natural Teaching Strategies

Parents were given instruction in the use of natural teaching strategies in a series of six sessions distributed over a period of five to six weeks. "Natural teaching strategies" is a phrase applied in this study to describe a set of teaching approaches that have been associated with the promotion of child development and enhanced parental satisfaction with that development (Marfo & Kysela, 1988). These strategies were designed to be used incidentally as situations arose throughout the child's day, hence the term "natural". The underlying rationale and literature support for the use of each of the specific strategies is described in the methods section.

Intervention directed at improving the quality of interaction could be assumed to enhance feelings of competency and increase both learned and self-generated problem-solving skills (PSC Factor), while reducing overall stress (AA Factor).

The following research question was designed to evaluate whether training in the use of natural teaching strategies resulted in the predicted outcomes.

Research Question 7

b. Does instruction in the use of natural teaching strategies have an impact on measures of Pile Ups, Social Support, Personal Coping Skills, and Family Resources and beliefs held by parents of handicapped children about child development?

Combined Effects of Intervention

The final set of research questions relate to the effect of both interventions on self-report measures and direct observations of parent-child interaction. Question 7c concerns the comparison of self-report measures completed at baseline, and following the final intervention. This comparison was carried out to determine if there was an effect of continued participation, not associated with either of the specific treatments.

Questions 8a-e involved the analysis of direct measures of parent-child interaction across both phases of the intervention. Following these questions a series of operational definitions related to the observational measurement of parent-child interaction are presented.

Research Question 7

c. Did continued participation in both interventions result in changes to self-report measures beyond that produced by either intervention alone?

Research Question 8

a. Was there a significant change in the communication mode utilized by the parents following participation in the natural teaching strategies component of the intervention, stress management training, or both?

b. Was there a significant change in communication mode utilized by the child following parental participation in the natural teaching strategies component of the intervention, stress management training, or both?

c. Was there a significant change in the ratio of mode-matched to nonmode matched interactions following parental participation in the natural teaching strategies component of the intervention, stress management training, or both?

d. Was there a significant change in the Mean Length of Turn following parental participation in the natural teaching strategies component of the intervention, stress management training, or both?

e. Was there a significant change in parental use of natural teaching strategies associated with either phase of the intervention?

Operational Definitions

Turn: A turn is defined as "any behavior which is directly responding to another person or is initiating contact with that person, followed by a similar behavior from the responding person".(McCarthy, 1986 p.40). Turns occur only in the context of interaction, a reciprocal response from the communication partner is a necessary component of a turn.

Turn behavior: Any behavior which is directed at, or responding to the other communication partner (does not require a reciprocal response).

Turn sequence: Turn sequence refers to a chain or sequence of topically related behaviors. The turn sequence is interrupted under the following conditions:

1. There is a cessation, or withdrawal from the interaction by one of the communication partners of 10 or more seconds.
2. Either member of the dyad demonstrates three or more consecutive codable responses without an intervening response from the other communication partner.
3. One of the partners introduces a novel action or topic, which does not appear to be directly related to the other partners previous behavior.

Communication mode: Turn behavior may be classified according to four modes or levels of complexity

1. Action: A non-verbal motor gestural behavior that appears to be either elicited by, or in response to the communication partners immediately previous behavior
2. Vocalization: A single sound or group of sounds which is not recognizable as a word, and does not appear to be an approximation of a word.

3. Word: A single word, or word approximation. Approximations must be clearly recognizable as an attempt at a word that makes sense within the context of the ongoing interaction
4. Phrase: A phrase involves two or more words.

Mode-matched and non mode-matched turn sequence: Any exchange may be classified into the following dichotomous categories.

1. Mode-matched: An exchange in which the response of one member of the dyad is within one communication mode of the other partner's previous behavior.
2. Non Mode-matched: An exchange in which the difference between one partner's behavior and the topic related response of the other partner is two or more communication modes.

Mean Length of Turn (MLT): Average number of turns per turn sequence, computed for a two minute observation period.

Turn balance: A measure of the equality of the communicative exchange between two partners in the dyad. Turn balance is the ratio of turn behaviors observed for the child compared to the number observed for the parent.

Model: A novel behavior that is directed towards the partner and is not apparently elicited by the partner's immediately previous behavior, or an elaboration of the child's previous behavior that prompts imitative behavior from the child.

1. A model must be at, or within one communication mode of the partner's previous behavior.
2. An elaboration is defined as a topic relevant behavior that does not contain part or all of the child's previous behavior.

Imitation: Repetition of all or part of the child's immediately previous behavior or an attempt at a repetition of that behavior. Imitations may include only slight alterations in form. Imitated responses that involve a higher communication mode, or that add new information are considered expansions.

Prompt: (McCarthy 1986, p.189: Mcdonald & Gillette, 1984)- An action, vocalization, word or phrase which is apparently designed to elicit a response from the child. A prompt is preceded by an unsuccessful attempt.

Guide: Physical contact with the communication partner apparently intended to guide the motor behavior of the partner towards a particular response.

Expansion: An action, vocalization, word or phrase by one partner which includes the immediately previous behavior of the other communication partner, and adds a topic relevant behavior which is no more than one communication mode higher than the partner's previous behavior.

Chapter 4

METHODOLOGY

Participants

Families considered eligible for participation in this study were recruited from three types of early intervention programs operating within the city of Edmonton Alberta. These programs included a home and school based program located at three public schools within the city, a home based program for infants and pres-choolers, as well as a support agency for handicapped children integrated into community daycares. The criteria for participation described in the original research plan included:

1. The chronological age of the child should be between 2 1/2, and 4 1/2 years.
2. Involvement in one of the three types of intervention programs described previously.
3. Moderate to severe handicaps as indicated by the Bayley Scales of Infant Development, or the Vineland Adaptive Behavior Scale.

Although not explicitly stated in the research plan additional criteria would logically include the parents willingness to participate in assessment and intervention activities extending over several months. These criteria were modified to accommodate the types of participants that were referred for the intervention. The characteristics of the parents and children who participated in some phase of the project are described in the results chapter.

The coordinators and supervisors of the intervention programs were contacted directly by the principal investigators. They were given general information about the project and provided with a letter of intent (see Appendix A) to be distributed to families that met the criteria and would, in the opinion of the supervisors, benefit from a study of this nature. The letter described the rationale for the project, time commitments, measures taken to protect anonymity and confidentiality, and a general description of the project. The letter also included an initial consent form and an attached self-addressed envelope to be returned to the researchers.

Due to low initial returns, recruitment procedures were modified as the project progressed. Either program staff or the project coordinator contacted potential participants by telephone. The purpose of the call was to answer any questions about the project and provide additional information. The voluntary nature of the project was emphasized in all communications with potential participants.

Upon the receipt of a signed consent form a member of the assessment team was designated to contact the family and arrange for the initial assessment session. During this initial home visit team members were directed to ascertain the participants understanding of the project and the time commitments involved. Final consent was secured at this time.

Project Personnel

The project staff consisted of three assessors, two group leaders, a coordinator and the principle investigators. Members of the assessment team, including two graduate students in educational psychology and a graduate student in elementary education, provided the primary contact with the families. They conducted the interviews, distributed and collected the questionnaires, carried out the developmental assessments on the children, and videotaped the interaction sequences.

The group leaders were also graduate students in education. They were responsible for conducting the intervention sessions, and meeting on a regular basis with the project coordinator. One of the leaders, a female, had experience and formal training in counselling, rehabilitative medicine, and special education. The second leader a male, had experience working with special populations, as well as migrant, and native American families.

The coordinator supervised the activities of the assessment, and intervention teams, collected and processed data, and liaised with agencies as well as parents. The coordinator, a graduate student in educational psychology, had direct experience working with families of handicapped children in early intervention settings.

The principal investigators were responsible for designing the research plan and advising on the operation of the project. Both investigators were instructors and researchers in the field of special education, and early intervention.

Assessment Procedures

An outline of the original plan for the sequencing of assessments, and the various measures used throughout the study is included in Appendix B. Due to delays in the completion of the interventions and the possibility of losing additional participants over the summer, Tests 4 and 5 were collapsed. A detailed and specific protocol guiding the sequence of measures and describing the information to be provided to the parents prior to their involvement in the intervention is included in Appendix C. Training in the administration of the Bayley Scales of Infant Development was provided through observation of training tapes, live demonstrations and practice administrations. Interview schedules were developed based on the prior study by Reddon (1989). The initial interview conducted by one of the project staff prior to intervention provided information in the following general areas: a/ demographic information (occupation of parents, education, number of siblings, family income etc.); b/ program information (program type, parental involvement in the program, parental satisfaction with the program's: format, staff, and communication, contribution of program to families perceived level stress); c/ parental perception of levels of support from all sources; d/ current strategies for dealing with stress; e/ use of any special teaching techniques. Follow-up interviews were conducted after each phase of the project. These interviews included questions related to parental perception of treatment effectiveness, the participants use of specific strategies, and the occurrence of significant changes in the lives of the parents.

Research Design

The original design was based on the availability of sufficient funds and parental participation to conduct a research project on a larger scale. This study involved the use of a counterbalanced design (Borg & Gall, 1989). In this design subjects would be divided into two groups. With reference to the present investigation, Group One would receive stress management training followed by training in use of natural teaching strategies, Group Two would receive identical treatments in reverse order. This type of design permits the researcher to determine if the order of administration of treatment has any effect on a dependent variable (Borg, & Gall, 1989). In addition, a two month delay between interventions was planned to allow time for treatment effects to emerge and to reduce the possibility of a confounding effect that might arise when one treatment carries-over to another phase of the intervention.

The original research plan was modified to accommodate lower levels of funding, the needs of the families involved, and the reduced numbers of participants. In total, three separate treatment groups were formed. One of the groups received stress management training only. Since some of the members of this group did not continue with treatment following the Christmas break, those parents wishing to continue were included in one of the other groups for the second phase of the project. The remaining groups received both interventions. As in the original proposal the order of treatment was reversed for the two groups that met simultaneously. Table 1 illustrates the order of treatment for all three groups.

There were several components to the analysis of data from the project. The first component, which involved the results of pretest measures only, included; 1/ descriptive statistics on the questionnaire and self-report data, 2/ comparisons between

TABLE 1

Order of Intervention for Each of the Treatment Groups

	Type of Intervention	
	Stress Management	Teaching Strategies
Group I	Nov./Dec. 1988	-
Group II	April/May 1989	Jan/Feb. 1989
Group III	Jan./Feb. 1989	April/May 1989

the test data and normative data (where such data is available), 3/ comparisons between data from the present study and the results of a prior study (Reddon, 1989).

In the second component of the analysis, the results of self-report measures taken, prior to, and following each of the interventions were combined and treated as a one-group pretest-posttest design. This type of quasi-experimental design involves three steps including the establishment of baseline data on the dependent measure, application of treatment, and post-test measurement of the same variable (Borg & Gall, 1989). Treatment effect is determined by comparison of the pre and post-test measures. The term quasi-experimental is applied because the design normally fails to exclude alternative explanations for experimental outcomes (Cook & Campbell, 1979).

Despite the presence of a number of limitations, quasi-experimental designs have been found to be useful in suggesting new ideas for further investigation (Cook & Campbell, 1979). This may be particularly true of preliminary studies involving the application of untried treatments, new combinations of treatments, or application of established treatments with different groups. In addition, it may be inappropriate to conclude that quasi-experimental designs exclude the drawing of valid inferences. As Cook and Campbell (1979) suggest, common threats to validity (which will be discussed at the end of the present chapter) may be unlikely when commonsense, accepted theory, or valid measurement of plausible threats dictate otherwise. These authors have identified a number of factors including, the measurement of multiple variables, contextual knowledge, and the intelligent presumption of what a group would be like without treatment, as nondesign ways of ruling out threats to validity in quasi-experimental designs such as the case study method (Cook & Campbell, 1979).

To a greater or lesser extent each of these factors apply to the present study. The application of the T-Double ABCX Model required the collection of data across nearly every aspect of family functioning. Given such a large number of dependent variables, it would be reasonable to assume that treatment had an effect if the majority of the measures remained constant, or fluctuated randomly, while a small number of variables demonstrated systematic change consistent with particular aspects of treatment. Interview data collected at various times throughout the study also allowed for a subjective evaluation of treatment effectiveness from the perspective of the participants. Finally, it seems plausible that significant changes in key variables that would otherwise remain relatively static, such as parental perspectives of child characteristics, might be attributable to treatment effects.

Determination of the effect of treatment on parent-child interaction sequences involved a descriptive analysis. This approach approximates what Kazdin (1982) refers to as an uncontrolled case study. This particular design was chosen because it allowed for the indepth analysis of a large number of variables. In addition, a low number of interaction sequences of codeable quality posed problems for the analysis of group effects.

While this approach does not normally permit the level of certainty associated with experimentation, the validity of the inferences drawn is dependent on the presence of certain characteristics of the study. These characteristics include: 1/ the use of objective data, 2/ collection of continuous data, 3/ stability of behavior prior to treatment, 4/ immediacy and magnitude of the change, and 5/ number and heterogeneity of subjects (Kazdin, 1982).

The present study incorporated three of these features. Systematic and objective data collection procedures were used, and the treatment was applied to multiple and heterogeneous cases. While data collection was not continuous, it occurred at three critical points, allowing for the monitoring of changes associated with specific treatments. In the absence of background data the stability of the behavior can only be assumed, however, it seems reasonable to suggest that interaction patterns between parent and child tend to be habitual. Finally the immediacy and magnitude of change has been used as a test of treatment effectiveness in the discussion of results.

Independent Variable

The independent variables in the family intervention project consisted of two treatments designed to enhance both Family Resources (BB factor) as well as Problem-Solving and Coping Strategies (PSC). The two interventions included; stress management training, and training in what was termed "natural teaching strategies". The format and content of the interventions will be described in detail in the following section.

Format

Both interventions followed a similar format. This format consisted of lectures, small group discussion, modeling by the trainer, and role play exercises involving the participants. In addition, "home work" assignments designed to increase generalization and enhance the relevance of the material were included in each session. Both interventions were presented in a series of six sessions, each one lasting approximately one and one half hours. Groups met at mutually agreed upon times, in one of two rooms in the Education building at the University of Alberta. Meeting times were changed to accommodate holidays, illness, or planned absences by more than one participant. Generally, the meetings occurred on a weekly basis. Sessions five and six were combined into a single extended session, for two of the groups.

The participants were encouraged to discuss the techniques presented, and to share any thoughts, or experiences relevant to the topic of that week's session. The group leaders were directed to be supportive but to keep the sessions focused on the acquisition of specific skills.

Each group had a single leader. The group leaders met on regular basis, usually weekly, with the project coordinator. The purpose of these meetings was to discuss any problems or concerns related to that weeks session, and to review the content of the following session. The project coordinator met, in turn, with the principal investigators on a regular basis .

A source of bias likely to affect a study involving multiple and complex interventions is "treatment fidelity". This source of bias is related to the extent to which the implementation of treatment conforms to the researchers specifications (Borg & Gall, 1989). In the present study, manuals (Kysela, McDonald, McClellan & Wilson, 1988) were developed to be used throughout both interventions. Each participant received a binder at the start of the study. At the end of each session, materials that related to the following week's session were distributed to the group members. These materials included background readings, an outline of the session, and homework assignments. In addition, the trainers copy of the manual included a section which specified the sequencing of activities, examples, scenarios for role play, and provided suggestions for expansion of topics.

The content of the manuals was based on current literature related to both stress and supports in families of handicapped children, effective techniques for managing stress, and interactional strategies that have proven beneficial in facilitating the development of handicapped children. Actual preparation of the manuals was carried out by the trainers and project coordinator, under the direction of the principal investigators. After completion, each section of the manual was reviewed by both of the principal investigators.

Intervention 1-Natural Teaching Strategies

This phase of the intervention involved group instruction in the use of several "natural teaching strategies". The strategies taught during this part of the intervention were designed to be used incidentally, as occasions arose during the course of the child's day, hence the term "natural teaching strategies". In the context of language development Hart (1985) has referred to this process as "environmental intervention", and as it applies to the teaching of motor acts, Kysela, Hillyard, McDonald and Alliston-Taylor, (1981) have described it as "incidental teaching".

Table 2 provides an overview of the content of this portion of the intervention. Sessions one to three focused on developing what MacDonald et al.(1984) terms the "conversational relationship" between the handicapped child and his/her significant other (SO). In this approach, joint or shared activities "form the content and contingencies for learning" (MacDonald, 1985, p.94). The goal of the intervention is to develop a balanced conversation in which the child's social, cognitive, and linguistic competencies can develop. MacDonald (1985) defined a conversation as a "joint activity in which the child and SO exchange messages in a sequence of turns, with or without words" (p. 98).

As this definition suggests, the essence of this approach is the development of an habitual pattern of reciprocal interaction, which facilitates the conversational relationship between the child and their parent, or other caregiver. This pattern involves a series of turns where each partner in the communicative act recognizes the other partner's attention and behavior, and provides a topically related response. In essence, both partners actively regulate each others' attention and behavior through reciprocal activities (Holdgrapher, Kysela, & McCarthy, 1989). Although this approach has been studied in the context of early language intervention (McCarthy, 1986), enhancing a child's ability to participate in social exchanges has obvious implications for his/her general social skills, as well as the degree of attachment between the child and his/her caregivers.

The ideas involved in this approach have been used in several studies (Girolametto, 1988; Grigg, 1983; McCarthy, 1986;), and have formed the basis of a number of intervention programs (MacDonald, & Gilette, 1984; Mahoney, 1988;

TABLE 2

Overview of Teaching Strategies

Session	Concepts or Strategies Taught
Session 1	-Conversational model of interaction (turn-taking) -Communication modes -Following the child's lead -Using imitation to achieve mode match
Session 2	-Turn balance -Developing a turn-taking habit -Wait-Signal-Prompt
Session 3	-Minimum Discrepancy model -Modeling for better turns -Horizontal expansions -Vertical expansions
Session 4	-Incidental Teaching (Motor, Self-Help, Recreational Domains) -Identification of skills for present and future environments -Effective models -The Tell-Show-Do approach to incidental teaching
Session 5	-Discussion of parental feelings associated with problem behaviors. -Identification of some of the "causes" of behavior problems in young handicapped children. -Communicative functions of behavior problems. -Self reinforcing function of behavior problems.
Session 6.	-Integration and Wrap-up

Manolson, 1983). Specific content for sessions one to three of the natural teaching strategies component of the present study were derived and adapted from these sources.

During session 1 parents were introduced to the conversational model of interaction. The participants received instruction in recognizing their child's mode of communication. Communication mode is somewhat analogous to the "form" of the communicative behavior. As the operational definitions indicated, these communicative behaviors were categorized into four modes or levels including action, vocalization, word, and phrase. Expanded definitions of these communication modes are included in Appendix D. The participants were also encouraged to engage in joint activities with their child by matching the child's communicative behavior through imitation. Imitation has been identified as an important environmental contingency that contributes to language development, serving as both a clue for further interaction and as confirming feedback (Hart, 1985).

MacDonald and Gillette (1984) described the goal of the conversational approach as achieving a balance in the number of reciprocal exchanges, or turns, between the child and their significant other. The idea of balanced turntaking was introduced in the second session of this phase of the intervention. A strategy termed Wait-Signal-Prompt (McCarthy,1986) was taught to the parents as a means of increasing the length of their child's exchanges. The strategy involved a patterned sequence of responses that the parent followed to elicit a topic relevant behavior from the child. The parent was taught to follow each communicative act with a pause of 5 seconds. This pause permitted the child time to respond to clues other than parent directives. Hart (1985) describes the introduction of a pause as the systematization of the naturally occuring process whereby parents of normally developing children expect their child to initiate more of the interaction. If waiting failed to result in a topic relevant response the parents were instructed to send the child a verbal, or non-verbal signal. Again the parents were encouraged to wait for the child to respond. As a final step the parents were directed to physically guide, or prompt their child through a turn.

The third session introduced parents to the Progressively Matched Modeling Principle (MacDonald, 1985). The application of this principle involves the provision of models that are slightly more complex than the child's previous communicative behavior. These more complex models were referred to as expansions. Two forms of expansions were introduced, horizontal and vertical. A horizontal expansion involves the parent imitating the child's behavior, while adding additional information in the same mode as the child (McCarthy, 1986). For example, a mother would be using horizontal expansion if she not only imitated her child waving good-bye, but extended the gesture by blowing a kiss. In the vertical form of expansion information that is of a higher mode is added to the child's behavior. In the example described above if the mother imitated the waving and added a vocalization such as "b, b, ba" she would be providing her child with a vertical expansion. MacDonald (1985) suggests that progressive matching of communication shapes new responses through differential reinforcement and incidental prompting. In the present study parents were encouraged to provide models that were no more than one communication mode above the child's previous behavior.

To provide the parents with a strategy for teaching recreational, self help and other forms of motoric behavior, a prompting hierarchy, sometimes referred to as the incidental teaching model (Kysela, et. al., 1981) was included in session 4. This procedure utilizes an ordered series of prompts descending from verbal cues to the use of physical guidance to teach motoric responses. Parents were directed to give simple verbal instructions, following up with first a gesture, and then the minimum level of physical guidance required to complete the task.

This procedure was introduced to the parents in the context of teaching functional skills. The parents were encouraged to identify a number of skills across several developmental domains which would enhance the child's independence now, or within the next five years. Using the formats described previously, the trainer demonstrated how this procedure could be used to teach these skills.

Although the fifth session of this phase of the intervention focused on the modification of undesirable behavior, the strategy introduced also had implications for parental appraisal (CC factor). Donnellan (1984) described a process for analyzing inappropriate behaviors in terms of the functional utility of the behavior. Undesirable behaviors are hypothesized to serve one of two dominant functions, they either serve to communicate, or provide some form of self-generated reinforcement. In this approach intervention is directed at identifying the specific function of a behavior, and modifying the child's environment, or teaching the child a more desirable behavior that serves the same function.

In the present study, the participants were given a process for formulating hypotheses about the functions of the undesirable behaviors and to identify possible alternate behaviors. The process involved five steps including; a) identifying specific behaviors, b) identifying the context in which the behavior occurs, c) formulating an hypothesis about the function of the behavior, d) testing the hypothesis, and e) altering either the circumstances under which the behavior occurs, or teaching a new behavior.

This component of the intervention was introduced through a discussion of parental feelings and cognitions related to difficult behaviors. The focus of the discussions was to provide parents with an alternate frame of reference and to discourage parents from interpreting these behaviors as a form of parental failure, or arising from an innate, or fixed characteristic of the child.

The final session involved a review and integration of the material presented during this phase of the intervention. The trainer reviewed each of the teaching strategies. The participants were asked to identified those components of the sessions that had the most relevance, and those which had the least.

Intervention 2-Stress Management Training

During this phase of the intervention parents received training in a number of techniques designed to reduce stress. The intervention involved the provision of information, discussions around relevant issues, and instruction and practice in the use of three coping strategies. Two of the strategies, cognitive restructuring and progressive relaxation have been used to lower stress in such diverse groups as teachers, high school seniors, and anxious or depressed adults, as well as treat such anxiety related disorders as dental phobias, tension headaches, and Type A behavior (Meichenbaum, & Deffenbacher, 1988). In addition, Singer (1988) recently found that stress management training, incorporating these components, was successful in reducing stress and anxiety levels in the parents of handicapped children. The third strategy, social support, has been found to be an important mediating variable in the perception of stress associated with the parenting of a handicapped child (Dunst et al.,1986, Friedrich et al., 1987; McKinney, & Peterson, 1987, Mines, 1988)

Table 3 provides an outline of the sessions related to stress management training. During the first meeting parents were provided with an overview of the format, and content of each of the sessions. The coping strategies were introduced briefly, and a discussion of the trainer's goals, and that of the participants took place. The participants were encouraged to talk about some of the problems associated with raising a handicapped child, as well as any benefits that might be associated with such a task. This framework of identifying concerns, as well as possible benefits or resources, was maintained throughout the remaining sessions.

Session 2 involved what Miechenbaum and Deffenbacher (1988) refer to as the conceptual stage of stress management training. The participants were introduced to a model of distress (Charlesworth & Nathan, 1984). The distress model identifies the major categories of common stressors, as well as maladaptive responses to stress and the long term effects of those responses. In addition, the participants were also

TABLE 3

Overview of Stress Management Training

Session	Concepts or Strategies Taught
1 Program Overview	-Goal Setting -Discussion of Format -Problem and Asset Exploration -Home work
2 Stress Management Training	-Stress and Wellness Cycles -Coping Strategies: i Social Support ii Relaxation iii Cognitive Restructuring -Homework
3 Feelings of Acceptance	-Issue Exploration: Myths -Acceptance: Child and Self -Use of Coping Strategies -Homework
4 Managing Time and Demands	-Issue Exploration: Care Giving Demands -Setting Realistic Goals i Self ii Child -Priority Setting -Use of Coping Strategies -Home work
5 Social Support	-Benefits -Rationale -Use of Coping Strategies -Home work
6 Integration and Review	

introduced to a model of wellness. This model illustrates how the use of various behavioral, physiological, and cognitive responses can lessen the effect of the same stressors, and result in a set of desirable outcomes for the client, such as increased self esteem and improved physical health. Following the informational portion of this session each of the three coping strategies of progressive relaxation, cognitive reframing and social support was explained, and modeled by the trainer, as well as practiced by the participants. Each of these strategies warrants a brief description

Relaxation training has been called a " robust and clinically useful response" (Stoyva & Anderson, 1982, p.752). In a brief review of the literature these authors cited evidence attesting to the effectiveness of relaxation training in treating tension headaches, insomnia, chronic anxiety and essential hypertension.

In the present study progressive relaxation was taught in several stages. First the trainer demonstrated the systematic tensing and relaxation of their own right arm, while directing the participants attention to the focus-tense-hold-release-relax cycle. Following the demonstration participants were guided through a relaxation exercise under the direction of the group leader. Finally, the members of the group were asked to participate in an extended relaxation exercise while listening to a tape. The parents were given a copy of the tape and assigned the task of practicing relaxation at least twice during the following week. Due to difficulties with the reproduction of the tape three of the participants received their personal copy of the tape at a later point during the project. Practice in relaxation was integrated into each of the remaining sessions.

Rational restructuring or cognitive reframing has been used in isolation (Goldfried, 1988), or as part of a package of stress management techniques (Miechenbaum & Deffenbacher, 1988) to treat a variety of stress, or anxiety-related problems. The goal of cognitive reframing is to assist individuals to obtain a more realistic perspective on stressful situations through the identification and modification of anxiety evoking cognitive events (Goldfried, 1988; Miechenbaum & Deffenbacher, 1988). Damrosch and Perry (1989) found that parents of Down's syndrome children rated cognitive restructuring as the most useful approach practiced by professionals in helping them adjust to the birth of their handicapped child.

In this study the coping mechanism of cognitive restructuring was taught through lecture, demonstration, self monitoring, and group participation. Scenarios were presented to demonstrate irrational thoughts that may occur in the course of parenting a child with exceptional needs. The undesirable feelings, behavioral, and physiological reactions associated with these thoughts were also illustrated. The trainer demonstrated how the same events as those presented in the scenarios could be reinterpreted in a more positive, and less anxiety provoking manner. Participants were encouraged to identify examples of irrational thinking from their own lives, and discuss them within a small group format. Through group discussion, and the trainers guidance, parents were directed to restructure these thoughts in a more positive way. Home practice was provided through assignments designed to encourage the self monitoring of irrational thoughts and associated behavioral and physiological responses. Trainer modeling, between session applications, and work within-group settings, have all been recommended as effective ways of promoting cognitive restructuring (Goldfried, 1988).

While not immediately obvious as a stress management technique, a substantial body of literature has identified social support as an important mediator of stress (e.g. Dunst et al.,1988; Frey et al., 1989). Schilling et al.,(1984) suggest that social support compliments other forms of coping mechanisms, particularly when those mechanisms begin to fail.

Within the context of the present study parents were provided with information on the significance of social support for families of handicapped children. Through lecture and discussion they were helped to identify existing sources of formal and informal support that might be available to them. Parents were provided with a list of names and telephone numbers of group members. For homework they were assigned the task of "buddying up" with one other group member to be contacted in between sessions. Social support was addressed in more detail in an additional session.

In sessions 3-5 the participants learned how each of the three coping strategies of relaxation, reframing and social support could be applied to a number of issues, which the literature and prior research (Cameron, et al.,1989; Reddon,1989) suggest have particular relevance to the parents of handicapped children. These issues included the parent's perception of their child's acceptability, the level of demand faced by the parent in the course of caring for a handicapped child, and in managing family life, and as mentioned previously, the necessity of developing an adequate support network.

Each of these issues was dealt with in a similar fashion. Lecture and reading material provided a background to the issue and a basis for discussion. The trainer used a set of questions to elicit accounts of relevant experiences from group members. The parents were encouraged to ignore idealized images of the "supermom", and other distortions related to raising children. Self monitoring of participants personal beliefs about parenting was encouraged through both the small group discussions, and homework assignments. The focus of these self monitoring activities was to assist parents identify unrealistic cognitions, and develop a rational, and balanced view of their assets and limitations as parents. Finally the trainer demonstrated how each of the coping strategies could be used to reduce stress associated with each of these issues.

As with the previous phase of the intervention session 6 focused on a review and integration of each the techniques demonstrated and practiced throughout these sessions.

Instrumentation

The instruments used in the present study may be classified into two categories: 1) those that were used to describe the sample in terms of the T-Double ABCX Model, and 2) those that were used both for descriptive purposes, and as pretest and post-test measures. In the following section measures used for descriptive purposes will be discussed first, followed by a the instruments used for both purposes. Finally, the measures of parent-child interaction will be described in some detail.

Descriptive Measures

Pile-Up (AA Factor)

Bayley Scales of Infant Development(BSID). The BSID is a well standardized measure of infant development for children 2 months to 2 years- 6 months (Sattler, 1988). The BSID was designed for use as both a clinical tool and as a research instrument (Whatley, 1987). Two standard scores, a Mental Developmental Index and a Psychomotor Developmental Index, are provided. These scores have a mean of 100 and a standard deviation of 16. Instructions are provided in the manual for converting the standard scores to age equivalents. The Mental Development Index contains 163 items that measure a number of facets of early cognitive development. The Motor Scale has 81 items that tap the child's fine and gross motor skill development, as well as their body control skills. Training and practice in administration is required

Standardization was conducted on sample of 1262 full-term nonhandicapped infants stratified on a number of important demographic variables (Sattler, 1988). Reliabilities for the Mental Scale ranged between .81 and .93 across the 14 age groups in the sample. The reliabilities on the Motor Scale were somewhat lower, ranging between .68 to .92. Correlation between the BSID and the Stanford - Binet : Form L. M. is reported to be .57 for children aged 24 to 30 months (Sattler, 1988).

In a recent review Watley (1987) stated that the BSID was particularly useful for documenting development for research purposes. Sattler (1988) also referred to the BSID as the best measure of infant development presently available.

The BSID was administered to the child usually during the first, or second visit to the participant's homes. As a standardized measure of development, the purpose of the

BSID was to establish the degree of delay demonstrated by the children of the participants. Only the Mental and Motor scales of the BSID were administered.

Vineland Adaptive Behavior Scale(VABS). The purpose of the VABS is to provide a measure of the social competence of handicapped and nonhandicapped individuals from birth to adulthood (Sattler, 1988). The VABS is not administered directly to the person being assessed; a responsible respondent who is familiar with the individuals behavior is required. There are three versions of the VABS available including an Expanded Form, a Survey Form, and a Classroom Edition. The Expanded Form, which was used in the present study, includes 577 questions related to each of the following domains; Communication Skills, Daily Living Skills, Socialization Skills, Motor Skills and Maladaptive Behavior. Standard scores with a mean of 100 and a standard deviation of 15 may be obtained for each of these domains. In addition, an Adaptive Behavior Composite, which combines the scores of the first four domains is also available.

The VABS was normed on a stratified sample of 3000 individuals in each of 30 age groups between birth and 19 years of age. Split half reliabilities for expanded version of the VABS range from .94 to .95 . Median reliabilities for each of the domains range from .91 to .95. Test-retest reliabilities over a two to four week period ranged from .80 to .90, while interobserver reliability from .62 to .75 (Sattler,1988).

The VABS was used in a recent study of stress and coping in families with young handicapped children (Frey, et al., 1989). The communication subscale of the VABS was found to be a significant predictor of psychological distress and family outcome.

In the present study the expanded form of the VABS was also used as a measure of the pile up of stressors (AA factor). The VABS was administered between the first and second intervention.

Family Adaptation (XX factor)

Family Assessment Measure (FAM). The FAM is a self-report instrument based on family process model that provides quantitative information on family strengths and weaknesses. The FAM has three major scales: 1) a General Scale that provides information on the family as a system 2) a Dyadic Relationships Scale which examines relationships between pairs of family members, 3) a Self-Rating Scale that looks at the individual's perception of her/his function in the family (Skinner, Steinhauer, & Santa Barbara, 1984). Each scale consists of seven subscales which can be combined to provide a mean score for that scale. Raw scores on the FAM can be converted to standard scores with a mean of 50 and a standard deviation of 10.

Analysis of the structure and reliability of this instrument was carried out on a sample of 475 families recruited from health and social service agencies carried out on a sample of 475 families recruited from health and social service agencies. Reliabilities for the three major scales ranged from .89 for the Self Rating Scale to .95 for Dyadic Relationships.

The FAM was used in the original research plan as an outcome measure, to be administered after each intervention. In the present investigation the results of the FAM was used to provide descriptive information on family adaptation on the participants.

Descriptive and Dependent measures

Pile-Up (AA factor)

Parenting Stress Index (PSI). The PSI is a self-report instrument designed to measure the magnitude of stressors associated with parenting (McKinney & Petersen, 1984). The PSI consists of two major subscales related to child characteristics, and parent characteristics, as well as an optional scale which measures stresses arising from situational factors. The Child Characteristics Domain comprises six subtests including the acceptability of the child to the mother, the level of parental reinforcement associated with the child, adaptability of the child, demandingness of the child, the child's distractibility, and the child's mood. The Parent Characteristics Domain is made up of eight subtests that provide information on important parent variables such as parental depression, sense of competence, feelings of isolation and role restriction, stresses related to the spousal relationship, sense of attachment, and the health of the parent.

The PSI was normed on 534 mothers attending small pediatric clinics in central Virginia (Abidin, 1983). The manual reports an overall reliability coefficient of .95 for the total scale. Adequate reliabilities of .53 to .82 for Child Domain, and .69 to .91 for the Parent Domain were reported in a review by McKinney and Petersen (1984). Abidin reports on a number of studies that provide evidence of construct, concurrent, and predictive validity. In addition, Abidin (1983) reports on two studies that suggest that the PSI is sensitive to reductions of stress as a result of psychological intervention.

Both mothers and fathers were asked to complete the PSI independently during the baseline condition, thereafter only the parent actually participating in the intervention completed the questionnaire.

Family Resources (BB Factor, and BBB Factor)

Family Inventory Resources for Management (FIRM). The FIRM is a ninety eight item self-report measure designed to assess a family's repertoire of resources at any given time (McCubbin, & Comeau, 1987). Item selection was based on a review of the literature in three areas: 1) personal resources, 2) family system internal resources, and 3) social support. The FIRM is conceptually divided into four scales. The scales include items related to family strengths such as; i) sense of mastery and health, ii) esteem and communication, iii) extended family support, and iv) financial well-being. These scales can be combined to yield a total resource score.

This instrument was factor analyzed in a study of 322 chronically ill children. The authors report internal reliability for all four scales is .89, while subscale reliabilities range from .62 to.85 (McCubbin, & Comeau, 1987). Limited evidence of the concurrent validity of the FIRM was presented in the form of significant correlations with the Family Environment Scales (FES). The FIRM has been used by McCubbin and his associates in a number of studies of the effect of family resources on several health related factors in children with Mylomeningocele and Cerebral Palsy.

Within the context of the present study the FIRM was used to describe the family resources available to the participants in the project. As a measure of the BB Factor it was used to compare the perception of family resources by mothers and fathers in the present sample, and to the data available in the Reddon (1989) study. The FIRM was also used in the post intervention analysis.

Social Support Inventory (SSI). The SSI is a 60 item self-report measure originally designed to measure the social support network of parents of young children. (McCubbin, & Thompson, 1987). Conceptually the SSI is organized into five types of support, including: emotional, esteem, network, appraisal, and altruistic. These types of support are derived from twelve sources such as: spouse, children, relatives, friends coworkers, church/synagogue, spiritual beliefs, community groups, professionals, special groups, TV/books, and other sources. Examinees respond on a three point scale ranging from 1, indicating no support from this particular source, to 3 indicating that they derive a great deal of support from this source. The SSI provides scores for each of the types and sources of support. In addition, a total support score can be derived by summing each of the individual sources.

Information on the psychometric properties of the SSI is quite limited. The manual reports that the construct validity of the SSI was assessed and supported by systematic literature review and ethnographic interviews. Test-retest reliabilities were reported at .81.

As a measure of the BBB Factor the SSI was used to compare levels of social support reported by mothers and fathers in the present sample, and compared to the data available in the Reddon (1989) study. The SSI was also used to determine if there was any change in the pattern of social supports following either or both interventions.

Family Problem-Solving and Coping (PSC factor)

Coping Health Inventory for Parents (CHIP). The CHIP is a 45 item self-report measure developed to assess the perceptions of parents with chronically ill children. Parents are asked to identify behaviors which they believe they are currently using to manage family life. Items used in the development of the CHIP were derived from studies of family response to stress, social support theory, family support theory, theories of the individual psychology of coping, and a fifth area related to a family's attempts to cope with health care issues through communications with professionals and parents in similar situations (McCubbin, 1987). A factor analysis carried out on a sample of 183 parents of children with Cystic Fibrosis indicated that this measure is comprised of three factors related to different coping strategies. These factors were designated as major patterns of coping. Coping Pattern I is termed Family Integration, Cooperation, and an Optimistic View of the Situation, it deals with the families efforts to maintain family cohesion and an optimistic outlook. Pattern II: Maintaining Social Support, Self Esteem, and Psychological Stability, involves parental attempts to develop relationships with others, maintain personal esteem, and manage pressures. The designation of the final coping pattern is self explanatory. Coping Pattern III has been designated as Understanding the Health Care Situation Through Communication with Other Parents and Consultation with the Health Care Team.

"Normative" data was obtained from a study of 308 parents of children with either Cystic Fibrosis or Cerebral Palsy. Evidence of concurrent and construct validity are provided through reports in the manual on two studies. One study found strong correlations between the CHIP and measures of family environment, the other indicated a significant relationship between maternal use of coping pattern II and indices of health status in chronically ill children (McCubbin, 1987). Reliabilities for the three coping patterns are reported as ranging from .71 to .79 (McCubbin, & Thompson, 1987,.p 176).

The CHIP was used to describe the pattern of coping reported by the participants in the study. In addition the results of the CHIP were used for the types of comparisons mentioned previously, and as a post-intervention measure.

Family Appraisal (CC Factor)

The Concepts of Development Questionnaire. As a measure of the schematic level of family appraisal, parents in the present study were given the CODQ. The CODQ is a 20 item questionnaire that taps parental beliefs about development (Sameroff, & Feil, 1985). This instrument contains two subscales, Perspectivistic Thinking and Categorical Thinking. These two subscales represent polar ends of a continuum of views toward development that vary from fixed notions such as "boy babies are less affectionate than girl babies", to relativistic attitudes such as "there is no right way to raise children".

Each item is rated on a four point scale ranging from a score of 3 for strongly agree, to 0 for strongly disagree. Three scores may be derived from the CODQ, including mean scores for both Perspectivistic and Categorical Thinking, as well as a total score. The total score represents the amount of agreement with the Perspectivistic items along with the amount of disagreement with the Categorical items.

The CODQ was standardized on a sample of eighty mothers of preschool children stratified according to the SES levels outlined in the Hollingshead Two Factor Index of Social Position (ISP). The author provides mean scores for the three summary scores at each of the SES levels (Sameroff, & Feil, 1985). The author reports an internal reliability coefficient of .82 for the total scale. The CODQ has been used by the author to study concepts of development in different SES, and cultural groups.

Both parents completed the CODQ at the start of the project. These data were used in comparisons of mothers and fathers concepts of development. The CODQ was also used as a measure of treatment effect on parental beliefs about development.

Measures of Parent-Child Interaction

Parent-child interaction was monitored throughout the study to determine the effect of the interventions on measures of interactive balance and match, as well as parental use of specific teaching strategies. Brief sequences of semistructured play were videotaped, prior to and following each intervention. Two coding systems, one a modification of an existing system and a second system developed specifically for this study, were used to evaluate the coded interactions. The procedures used during the videotaping, the coding systems, and associated reliabilities will be described in the following section. It should be noted that circumstances such as difficulties with child care and transportation prevented strict adherence to controlled conditions. Any deviation from the procedures described here will be reported in the results section.

Each parent-child dyad was videotaped for two, two and one half minute sequences at baseline and upon completion of each phase of the intervention. Videotaping took place, except as noted, in a room designed for that purpose at the University of Alberta. The room is carpeted and is furnished with tables and chairs. Activities taking place in the room can be recorded by four, ceiling mounted videocameras. Monitors in an adjoining room allowed project personnel to control camera angles and sound quality.

The parent was given a choice of toys from a limited selection and instructed in the use of that toy. These toys were alternated with a toy brought from home. The dyads were free to play on the floor or sit at the table. For those sequences recorded in this setting, only the parent and child were present in the room during the videotaping.

Turntaking Measures

The analysis of the videotaped sequences was carried out utilizing two types of measures. A substantially modified version of the Preschool Observation Scale (Kysela, & Barros, 1983) was used to provide information on indicators of communicative match and interactive balance. These indicators included the degree of match between the communicative modes used by each member of the dyad, the ratio of child to parent exchanges, and the mean length of turn sequence. The original version of the Preschool Observation Scale (POS) utilized five behavioral categories to describe communicative behavior including Response, Initiate, Imitate, Signal and Guide. In addition the POS further analyzed the interaction into the four communicative modes described previously (action-level, vocalization, single word and phrase). In effect, the original version of the POS permitted the analysis of any given exchange into five categories, and four modes for each member of the dyad. Initial attempts to use this system resulted in unacceptable reliabilities.

In a study of observational forms of measurement, Mash and McElwee (1974) found that observational reliability was, in part, a function of the complexity of the system used. These authors advise that attempts to obtain finer bits of information should be weighed against the cost of lower reliabilities. Following this advice, the five categories included in the original POS were reduced to two, Initiations, and Responses. The four modes including action-level, vocalizations, single words and phrases were felt to be an essential measure of communicative balance and were retained.

Data was recorded manually on sheets designed specifically for that purpose. These sheets contained adjacent columns to allow for continuous recording of both members of the dyad. The videotaped sequences were timecoded and space was provided on the data sheets to record the time of exchanges, allowing the observers to confirm ambiguous exchanges. Appendix D includes the training guide, operational definitions, and data sheets for the revised version of the POS.

Measures of Teaching Strategies

An observational coding system was developed to measure changes in parental use of teaching strategies during the study. Seven categories of behaviors were defined. These categories were based on the content of the interventions, and a coding system used by McCarthy(1986) to measure interactional strategies in parent-child dyads. The categories used included models, imitations, signals, guides, horizontal expansions and vertical expansions. The seventh category, undifferentiated responses was included to allow for continuous recording of parental behavior. This category included all those behaviors directed at the child that did not fit the operational definitions of the categories listed above. In addition, since systematic use of delays have been identified as an important environmental contingency in language development (Hart, 1985), and was emphasized at several points throughout the intervention, the presence or absence of pauses of three seconds or more were recorded.

Coding of parental use of teaching strategies involved three steps. Each behavior that was directed at the child was classified into one of the seven categories of behavior. At that point the videotape was stopped and replayed to determine the length of the pause between one parental behavior and the next. Finally the child's behavior was classified as related or unrelated to the topic.

Observer Training and Reliabilities

Training in the use of the original POS was provided by a graduate student with extensive experience with the system. After the original POS was modified, a guide to the revised system was prepared. This guide was used in the training of an observer who was hired to complete the reliability checks. Training of this observer also involved verbal instruction, demonstration, and guided practice. The observer was a student in a local community college who had a theoretical and applied knowledge of behavioral analysis and observation. The fact that this observer was unfamiliar with the literature on parent-child interaction and the specialized usage of the category labels was seen as an advantage. Coding commenced when the observer and the author reached 80% agreement during an independently coded, two minute sequence of interaction.

Measures of reliability were carried out for approximately 20% of the sequences (5 out of 24). Segments were chosen randomly by selecting a piece of paper containing the family number and session from a pile. Reliability was calculated by dividing the number of agreements by the total number of agreements plus disagreements. While this form of reliability check is prone to overestimating agreement when chance agreement is high, it has the advantage of ease of computation and interpretation, as well as sensitivity to bias and systematic error (Sattler, 1988). A superior form of reliability check, point by point agreement was not calculated due to the problems inherent in continuous recording. As Lytton and Zwirner (1975) have commented "to achieve agreement in recording exactly the same action at the same moment in a free flowing situation with a multitude of activities going on is extremely difficult" (p.772). Reliability checks were interspersed throughout the coding of the sequences to avoid "observer drift".

Table 4 contains the results of reliability checks for the revised version of the Preschool Observation Scale (POS). Reliabilities for the total scale ranged between 79.2% to 92.6% agreement for children, and 86.8% to 91.2% for adults. Variability in the percentage of agreement on specific behavioral categories were much more pronounced for observations of child behaviors, compared to adult behaviors. Percentage of agreement ranged from a high of 95% for the category "Response" to 50% for the category "Phrase". The low reliabilities associated with the child's use of phrases is largely a result of low frequency of that class of behavior, and a single reliability check conducted at the start of the study. Frequencies of Phrases used in the reporting of results and the calculation of mode matched turns represented the more conservative estimates of frequency.

TABLE 4

Calculations of Reliability for Preschool Observation Scale (POS)

	Mean % of Agreement	
	Adult	Child
Action	86.0	86.4
Vocalization	90.4	83.5
Word	83.3	61.5
Phrase	90.9	50.0
Initiation	81.6	61.5
Response	94.2	95.0
Total	89.2	85.9

The reliability of the observation system utilized in the coding of parental use of teaching strategies was carried out in much the same manner as that described for the POS. Approximately 20% (5 out of 24) of the sequences were scored independently by two observers at intervals interspersed throughout the coding period. Appendix E contains the scoring guide and data sheet for this coding system. The same individuals described in the previous section completed the observations and reliability checks on the parental use of teaching strategies.

Mean reliabilities for the full scale and each of the subscales are given in Table 5 Percentage of agreement for the total scale ranged from 79.0% to 95.7%. As would be expected, reliabilities for specific strategies were generally lower. Agreement ranged from as low as 57% for Horizontal Expansions to 93.7% for Undifferentiated Responses.

Threats to Validity

Internal Validity

Borg & Gall (1989) have defined internal validity simply as "the extent to which extraneous variables have been controlled by the researcher" (p. 634). In other words internal validity refers to the degree of confidence that the changes in the dependent variable truly result from the application of treatment. Major threats to the validity of quasi-experimental designs include history, maturation, statistical regression, instrumentation, and testing (Cook & Campbell, 1979). These threats to validity will be defined and discussed in the context of the present study.

History. Historical threats to internal validity refer to events occuring at the time of an experiment which may influence an outcome that would otherwise be attributable to the treatment (Kazdin, 1982). History poses a plausible threat to the present study because of the extended time frame involved. In addition, the involvement of the participants in early intervention programs could exert an effect on both stress levels and parent-child interaction.

TABLE 5

Calculations of Reliability for Teaching Strategies

	Mean % of Agreement
Model	70.0
Imitation	66.6
Signal	63.6
Guide	No observed occurences
Undifferentiated Response	93.5
Pause	91.8
Horizontal Expansion	57.0
Vertical Expansion	85.7
Child Response	88.8
Total	87.8

Maturation. Maturation refers to physical and psychological processes that occur over time (Borg & Gall, 1989). Maturation poses a threat to the validity of a study when maturational changes are not accounted for in the determination of treatment effects. In the context of the present study maturation could pose a threat to the validity of inferences drawn about treatment effects on parent-child interaction. However, the effect of maturation is likely to be somewhat reduced in studies involving handicapped children.

Statistical regression. This threat to validity refers to the tendency for extreme scores to revert to the mean on reassessment (Cook, & Campbell, 1979). Some of the parents in the present study obtained extreme scores on self-report measures at baseline, regression is therefore a plausible threat to the present investigation.

Instrumentation. The threat to validity posed by instrumentation occurs when there is a change in the measuring instrument. These changes are most likely to result from the use of human observers whose judgements are subject to fluctuation (Kazdin, 1982). Obviously this threat is more relevant to the coding of videotaped sequences of parent-child interaction. Attempts to insure that all coding procedures represent valid and reliable measures have been detailed elsewhere.

Testing. Testing constitutes a threat to validity when changes occur as a result of repeated testing. Typically this occurs when exposure to an outcome measure provides an impetus for better performance on retesting (Cook & Campbell, 1979). In the present study, however, repeated assessment involving a large number of self-report measures is more likely to lead to mechanical responding brought about by fatigue. The extraneous influence of testing is, therefore, unlikely to lead to a reduction in the parental reports of stress.

External Validity

External refers to the generalizability of research findings. Borg and Gall (1983) define this form of validity as "the extent to which findings of an experiment can be applied to other settings"(p.638). Cook and Campbell (1979) extend that definition to include particular target populations and times.

Population validity. Population validity (Borg, & Gall, 1983) is the component of external validity that has to do with generalization from the experimental sample to a defined population . In the present study, the participants may not be completely representative of all parents of pre-school children with moderate to severe handicaps. The results indicated that the participants reported a fairly high level of financial well-being and were generally well educated. However, within this limited sample there existed both sexes, as well as a range of occupations, ages, and educational backgrounds. Such heterogeneity may be desirable in that it is representative of a broader range of parents of handicapped children. Cook and Campbell (1979) suggest that a number of smaller studies, with haphazard samples, may in fact enhance validity to a greater extent than a single large sample with an initially representative sample.

Generality across time (Kazdin, 1982). This threat to external validity refers to the generalizability of results beyond the time of assessment. Although maintenance and review procedures were not incorporated into the design of the present study, delays of four to six weeks between treatment and the completion of post-tests helped to insure that treatment effect would not be limited to the time period immediately following intervention.

Ecological Validity

Ecological Validity (Borg & Gall, 1989) describes a number of threats to the generalizability of experimental findings to other environmental conditions. The following threats to ecological validity have implications for the present investigation:

Explicit description of the experimental treatment. This threat to validity occurs when the treatment is described in insufficient detail to permit replication (Borg & Gall, 1989). Potentially this could pose a very significant threat to studies, such as the present one, that employ complex treatments. Preparation of detailed trainer's manuals, however, greatly reduce the problem presented by this particular threat.

Multiple treatment interference. Difficulties can arise when attempting to generalize from studies involving the application of multiple treatments (Kazdin, 1982). In this type of situation it becomes difficult to attribute change to a particular treatment, since the combination of treatments, or even the order, could have effected the outcome. In the present study order of treatment varied for each of the groups. In addition, treatment outcomes were determined not only at post-test following each of the interventions, but also between baseline and the end of the study. Finally, determination of effect of each of the specific treatments was associated with particular measures. For example, it seems reasonable to draw a link between changes in measures of teaching strategies and parental participation in that component of the intervention. However, the designs did not allow for the determination of which components of each treatment were, or were not effective. At this level of analysis Multiple Treatment Interference is a plausible threat to validity.

Experimenter effect. Experimenter effect occurs when the effectiveness of treatment is closely associated with the person administrating it (Kazdin, 1982). Within the context of the present investigation this threat was reduced to a limited extent by the involvement of two trainers, each of whom differed in terms of gender, education, and professional experiences. However, since the groups were not large enough to permit direct comparisons of treatment outcomes for each trainer, Experimenter Effect continues to present a significant threat to the generalizability of the findings.

Pretest sensitization. This threat to external validity refers to the possibility that assessing subjects prior to intervention sensitizes them to the nature of the treatment (Kazdin, 1982). Given the participants level of education, and the wording of the items on the self-report measures, response bias on subsequent post-test is a plausible threat to external validity. The large numbers of items contained in the battery of self-report measures, however, would help to mask the responses that would be consistent with treatment effect.

Hawthorne effect. The Hawthorne Effect is likely to be a confounding influence on the generalizability of treatment whenever the participants are aware of their involvement in a study. Knowledge of participation, and the changes in events associated with the research can alter the subjects' behaviors, and confound the specific effects of treatment (Borg & Gall, 1989) In the present study, the extensive assessment procedures, provision of binders, and even the setting could conceivably lead participants to report changes in outcome measures apart from the impact of the interventions.

These threats to validity need to be kept in mind in considering the results presented in Chapter 5. The validity of the inferences drawn and concerns related to the methodology will also be included in the discussion of results in Chapter 6.

Chapter 5

RESULTS

The following chapter will present the information collected on the participants throughout the course of this investigation. The chapter is divided into three major sections. The first section will describe the participants and their children. This section will also compare the results of self-report measures collected during baseline to normative information, as well as data collected during the Reddon (1989) study, which involved a similar sample. The next section will compare pre and post-intervention results of self-report measures at several points during the study. Finally a descriptive analysis of parent-child interaction sequences for four mother-child dyads will be presented.

The results of these analysis will be described with reference to a series of research questions. The research questions will be presented in the order outlined in chapter III.

Results of Descriptive Measures

The parents and children who participated in the Family Intervention Project are described in the following sections. All participants who completed the initial assessment procedures are included in the data that are presented here. These data typically involve an interview with the parent, an intellectual assessment of the child, and the completion of several self-report measures. Data from participants who failed to complete all phases of the intervention were included to determine if two samples drawn from a similar population reveal a common pattern of scores on measures related to the T-Double ABCX Model.

The Parents

Seventeen families participated in at least one home visit. Of these original participants, 11 parents completed one phase of the intervention and eight parents completed both phases. Table 6 describes the attrition rate at various phases of the project.

Demographic data is available on the seventeen mothers, and fifteen fathers who originally agreed to participate in the study, this data is summarized in Table 7. The mean age of these mothers was 34.9 years, with a standard deviation of 5.3, and a range of 26 to 45 years. The ages of the fifteen fathers ranged between 30 and 48, with a mean of 37.7 years, and a standard deviation of 5.0 years.

Educational levels for both fathers and mothers were exceptionally high. Eight of the mothers had graduated from college or university with one of these mothers completing graduate, professional level training. Of the remaining mothers, two had completed some college training, four had completed high school, while only one had less than a full high school education. The fathers in the study reported even higher levels of education than their partners. Two of the fathers had graduate or professional level training, ten had completed university or college, one father had partially completed post secondary education, while the remaining two fathers had finished high school. The fact that approximately 80% of the fathers had university or college level education might be attributable to the fact that the intervention took place on a university campus, and may have attracted participants who were familiar with the university.

With respect to employment, 11 of the fathers worked full-time. Three of the fathers were unemployed, while the remaining father did not respond to the question dealing with occupational status. Three of the mothers were employed full-time outside of the home. Six of the mothers were employed on a part time basis, while seven identified themselves as full time home makers.

TABLE 6

Attrition rate

Stage of Project	Mothers	Fathers
1/ Agreed to one home visit, and completed some self-report measures.	16	13
2/ Attended at least one session.	10 (65%)	7 (54%)
3/ Attended all or most of sessions intervention 1.	9 (63%)	7 (46%)
4/ Attended all, or most of both interventions.	6 (38%)	2 (15%)

TABLE 7

Characteristics of Parents

Family No.	Age	Occupation	Education
151(father)	35	Unemployed	College
151(mother)	35	Daycare worker	College
152(father)	38	Partsman	High school
152(mother)	34	Cashier(P)	High school
153(father)	37	Chemist	Graduate school
153(mother)	30	Homemaker	University
154(mother)	40	Homemaker	College
155(father)	45	Engineer	Graduate school
155(mother)	40	Bookeeper(P)	University
157(father)	33	Unemployed	College
157(mother)	33	Office manager	High school
158(mother)	33	Sales clerk	High School
253(father)	30	Administrative officer	University
253(mother)	26	Office manager(P)	High school
254(mother)	37	Physiotherapist(P)*	University
255(mother)	28	Homemaker	High school
351(mother)	32	Unemployed	Grade 10, or 11
352(mother)	42	Homemaker	University
353(father)	35	Chef	College
353(mother)	28	Manager(P)	College
354(father)	30	Mover	Grade 10, or 11
354(mother)	28	Student	High school

TABLE 7 CONTINUED

551(father)	--	---	University
551(mother)	37	Librarian	University
552(mother)	45	Homemaker	University
554(father)	42	Unemployed	College
555(father)	42	Sub contractor	High School
555(mother)	39	Homemaker	High school

* Indicates part time.

Hollingshead (1975) developed an index of socioeconomic status based on type of employment and level of education. SES scores for the seventeen families ranged from 16 to 66, with mean of 46 and a standard deviation of 15.6. Under the hierarchical system of grouping proposed by this author, the parents in the present study fit in the business/technical/minor professional class, or the second highest level. The wide degree of variance noted in occupation and educational backgrounds was also apparent in the income levels within the sample. Total family income ranged from less than $10,000 annually to more than $60,000. Median family income was $25,000 to $30,000

In summary, the parents in this sample were for the most part mature, typically in their mid-thirties, and well educated. Most notable about this group of parents was the degree of variance across several significant demographic variables. This variation is evident in the range of both income and educational levels. In addition, it is important to note the presence of two single parent families, as well as three unemployed fathers.

The Children

All children in the sample were administered the Bayley Scales of Infant Development (BSID). Ten children exceeded the limits of the BSID, while invalid or unreliable results were obtained for two of the subjects due to blindness. A Vineland Adaptive Behavior Scale (VABS) was completed on all but one of the children whose parents completed at least one phase of the intervention. An attempt was made to access assessment information on those children whose parents dropped out of the project before the VABS could be administered. These parents were contacted by telephone and in writing in order to solicit their written permission to examine relevant school records. Permission to access school records was granted for four out of the five contacted. Diagnostic information was obtained from parental report or student records except in the case of the children with Down Syndrome where the diagnosis was clearly apparent.

Table 8 presents the demographic, psychometric and/or diagnostic information on the children. The ages of these children in months ranged from 29 to 64, with a mean of 43.5, and a standard deviation of 10.5. The sample included 11 males and 6 females. Intellectual and adaptive functioning levels as measured by the BSID, VABS, or file information ranged from mildly delayed with severe communicative and or behavior problems to severe delays across both areas.

Comparative Analysis of Self-Report Measures

In the following sections the results of self-report measures will be described in terms of their descriptive statistics including means, standard deviations, and range of scores. These results will be presented in tabular form. Wherever possible contrasts will be made with normative data, and other comparison groups involved in the construction of these instruments. Significant differences in the patterns of responses of mothers and fathers will also be described. The statistic chosen for these comparisons was the independent t-test. The Irwin Fisher Two Sample Median Test was used in those comparisons where the assumption of normal distribution was clearly not possible, or when the N size for one or both groups fell below ten subjects. Although not as powerful as the classical two sample t-test, the Irwin Fisher Two Sample Median Test is recommended if the distribution is sharply peaked (Marascuilo & McSweeney,1977).

Visual analysis utilizing box and whisker plots of total scores, as well as selected subscale scores will be presented on those measures where a comparison of means was not possible. These plots provide a visual representation of the range of the data. The upper and lower boundaries of the box represent the 75th and 25th percentiles respectively, while the line intersecting the box is the median. The ends of the arms extending from the box indicate the 90th and 10th percentiles. Scores falling outside of that range are represented by circles.

TABLE 8

Characteristics of the Children

Family No.	Age	Sex	BSID Mental	BSID Motor	VABS	Diagnostic Information
151	39	F	23	15	-	Down's syndrome
152	37	F	N/C*	29	-	Moderate/severe language delay, 6 month intellectual delay
153	50	M	2.5	4	-	-
154	43	M	N/C	N/C	73	-
155	43	M	N/C	N/C	48	Autism
157	64	F	N/C	N/C	-	Blind
158	53	M	N/C	N/C	58	-
253	60	M	N/C	N/C	-	Behavior and communication disorder, Intellectual delay of 6 months
254	37	M	23	18	60	Down's syndrome
255	37	M	N/C	N/C	75	-
351	52	M	N/C	N/C	-	Blind
352	53	M	N/C	N/C	80	-
353	47	F	N/C	N/C	-	Behavior/communication disorder, Intellectual delay 6 months
551	28	M	13	15	55	Down's syndrome
552	34	F	N/C	N/C	66	Down's syndrome
554	34	M	12	6	50	-
555	29	F	N/C	N/C	-	Fetal Alcohol Syndrome*(source mother)

* N/C Indicates a ceiling was not achieved.

All results will be described with reference to the research questions they were intended to address.

Measures of Pile Up

Research Question 1a

> Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences on measures of perceived stressors, or Pile Up (AA Factor)?

Descriptive statistics on the Parenting Stress Index for mothers and fathers are presented in Table 9, along with normative data obtained from the manual (Abidin, 1986), and mean scores from the study by Reddon (1989). In the current sample mothers mean total score on the Parenting Stress Index was 259.9. The scores ranged between 189, and 352 with a standard deviation of 49. According to the manual the mothers' mean score falls between the 80th and 85th percentile relative to the standardization sample. Abidin (1986) recommends professional referral if an individuals score exceeds 267 . Of the sixteen mothers in the present sample, seven, exceeded the criteria for referral.

The mean total score on the Parenting Stress Index for fathers was 253.2, placing the fathers as a group also between 80th and the 85th percentile relative to the general norms. It should be noted, however, that the Parenting Stress Index was normed on a group of predominantly white mothers (Abidin, 1986). It is difficult, therefore, to make direct comparisons between the fathers involved in this study and the normative data presented in the manual. The manual does, however, report on a study involving a group of 100 fathers. Mean total score for this normative sample was 201.6. Abidin (1986) suggests, based on this sample, that fathers scores are significantly lower on all components of the Parenting Stress Index. Mean scores for fathers in the present sample are in excess of two standard deviations above the mean for the Abidin (1986) sample, indicating an exceptionally high level of stress relative to the fathers of non-

TABLE 9

Means, Standard Deviations and Statistical Significance (p) of Scores for Mothers and Fathers on the Parenting Stress Index (PSI)

Mothers/Fathers	Family Intervention Project				Normative	Reddon(1989)
PSI Score	Range	Mean	Deviation	p	Mean	Mean
Adaptabilty	24	31.1	7.1	.59	24.5	30.3
	19	32.8	6.1			27.2
Acceptability	16	19.6	5.0	.18	12.5	21.6
	11	21.4	3.0			19.9
Demandingness	16	23.6	4.9	.81	18.1	25.8
	13	23.9	5.1			24.3
Mood	18	11.4	4.7	.94	9.6	11.7
	13	11.5	3.5			11.9
Distractibility	18	29.8	5.4	.51	24.4	29.8
	15	28.8	3.8			27.4
Reinforcement	18	13.8	5.2	.15	9.3	12.2
	12	11.8	3.5			11.4
Depression	20	21.0	6.0	.05	20.4	20.1
	15	17.8	4.5			18.5

Table 9 Continued

Attachment	14	14.2	4.0	.73	12.6	12.6
	8	13.7	2.8			13.5
Restriction	16	18.0	4.8	.29	19.0	20.9
	22	16.7	6.3			17.3
Competence	19	30.2	5.7	.33	29.2	30.4
	16	28.7	5.1			29.1
Isolation	16	14.2	4.9	.05	12.8	12.6
	16	16.8	4.6			12.4
Spouse	19	19.2	5.6	.06	16.8	18.2
	16	16.2	4.4			15.5
Health	16	13.3	4.3	.35	11.9	13.3
	11	12.2	3.8			11.4
Child Total	85	130.1	26.3	.97	98.4	131.2
	48	130.3	15.7			122.8
Parent Total	104	129.8	29.7	.37	122.7	134.3
	86	122.8	23.1			117.8
Total PSI	163	259.9	49.7	.60	221.1	265.5
	111	253.2	31.4			240.6

Note. Statistical significance for mean difference was obtained from a 2-tailed t-test for independent samples.

handicapped children. Individual scores ranged from 195 to 306, with four of the fathers obtaining scores high enough to warrant professional referral. In contrast to the pattern suggested in the manual (Abidin,1986), the degree of difference in the total PSI scores obtained by mothers and fathers involved in this study was not statistically significant.

The Parenting Stress Index is comprised of two subscales, the Child Characteristics Domain and The Parent Characteristics Domain. Each of these subscales will be discussed in turn, with reference to Domain totals, as well as significant differences in mean subtest scores for mothers and fathers in the sample.

The Child Characteristics Domain is designed to measure specific child characteristics and qualities of temperament that impact upon a parent's ability to carry out their parenting role (Abidin, 1986). The scale attempts to account for both child characteristics and the parent's appraisal of those characteristics. High scores on this scale, relative to the Parent Characteristics Domain, suggest that child characteristics are a key factor in the parent's feelings of stress. Abidin (1986) reports that higher scores on the Child Domain Scale of the Parenting Stress Index are frequently found in families with handicapped children. As many as five or six scales may be elevated beyond the 90th percentile in these families. The manual gives a mean score for the standardization sample of 98.4, with a standard deviation of 19.2.

Mean Child Characteristics Domain score for the mothers in the present sample was 130.1, with a standard deviation of 29.1 and a range of 89 to 193. The mean score for this group of mothers falls in the 95th percentile relative to the normative sample. Mean subtest scores at or above the 90th percentile were obtained for child characteristics related to Adaptability, Acceptability, Demandingness, and Reinforcement to the Parent. Scores related to the child's distractibility were in the 85th percentile range.

Mean Child Characteristics Domain score for fathers in this sample was virtually identical to that of the mothers. The mean for the father sample was 130.3, with a standard deviation of 15.7, and a range between 114, and 162. This mean score falls in the 95th percentile. Mean subtest scores for Adaptability, Acceptability and Child Reinforcement were similar to the mothers in the sample, falling above the 90th percentile. Demandingness and Distractibility fell at the 85th percentile.

The Parenting Domain Subscale is designed to measure aspects of the parents functioning that may contribute to stress, or dysfunction within the parent-child system (Abidin, 1986). Mean score of the standardization sample on this subscale is 122.7, with a standard deviation of 24.6.

In accord with the trends suggested in the manual (Abidin, 1986), mean scores for the Parent Characteristics Domain subscale were lower for both the mothers and fathers in this sample than the mean scores obtained for the Child Characteristics Domain. The mean Parent Domain scores for mothers in this group was 129.8 with a standard deviation of 29.7 and a range of 89 to 193. This mean score places these mothers in the 65th percentile relative to the normative sample, or within the non-clinical range. Three of the mothers obtained scores above the 90th percentile. The two highest mean subtest scores in the Parenting Characteristics Domain for mothers were Attachment and Parental Health, at the 75th percentile.

The fathers in the sample obtained a marginally lower cumulative score on tests of stress associated with the parenting role. Mean scores for fathers on the Parenting Domain Scale were 122.8, or at the 55th percentile compared to the normative sample, with a standard deviation of 23.1 and a range of 75 to 161. Two of the fathers obtained scores in excess of the 90th percentile. As with the mother sample the mean score obtained for Attachment was at the 75th percentile. Unlike the mothers in the sample, however, mean scores for fathers on the Isolation subtest fell at the 85 th percentile.

Of the mother/father differences in the Parenting Characteristics Domain two subtests, Isolation and Depression, were significantly different at a .05 level. Fathers reported greater feelings of isolation from their peers, relatives, and other sources of emotional support. Mothers on the other hand reported a greater sense of depression related to the parenting role. In addition, differences approaching significance were also obtained on a measure of spousal support (p.=.06). Again mothers reported a somewhat higher level of stress associated with the spousal relationship.

In summary, both mothers and fathers reported significant levels of stress relative to the normative sample (p.=.007, and p.=.003 respectively). More than one third of the participants in the present sample obtained scores high enough to warrant professional referral. Mean scores in the Child Characteristics Domain were higher than that of the Parent Characteristics for both fathers and mothers in the sample. Mean scores for both parents related to child characteristics fell in the 95th percentile. The subtests of Adaptability, Acceptability, and Demandingness were elevated at or above the 90th percentile for both mothers and fathers, suggesting that child characteristics related to these descriptors are a significant source of stress for this group of parents.

In contrast to the pattern suggested by Abidin (1986), fathers' mean scores on the total Parenting Stress Index, as well as both major subscales were very similar to that of the mothers. Notable differences occured on measures of stress related to the parenting role. However, the finding that fathers' perceived levels of stress associated with child characteristics equalled that of the mothers is a departure from the expected pattern, and as a result is worthy of further consideration.

Research Question 1b

> Do parents of young handicapped children who express an interest in becoming involved in stress intervention, differ significantly from a similar group of parents not involved in intervention, on measures of Pile Up (AA Factor)

The question of whether the data from the present sample is representative of a pattern of stress common to parents of young handicapped children can be addressed through comparisons to similar samples. The Reddon (1989) study described in previous sections will be used for these comparisons.

When comparing the two groups of families, total levels of stress reported by the mothers were relative similar (see table 9). No significant differences were found in the total Parenting Stress Index, Child Characteristics Domain, or the Parent Characteristics Domain. Of the mean Subtest scores only that of Feelings of Restriction was significantly different (p.=.003) under a two tailed t-test for uncorrelated means. Mothers in the present sample reporting feeling less restricted than their counterparts in the Reddon study. The subtest related to child demandingness approached significance (p.=.1), with the mothers in the present sample perceiving their children to be less stressful in terms of that particular characteristic.

Contrasts between the two groups were more apparent in the fathers' reponses to the the Parenting Stress Index. Differences in the mean total scores for the entire instrument were marginally higher for the present sample (p.=.17). In terms of the two major subscales, differences in the total scores for the Parent Characteristics Domain were unremarkable, while differences in mean responses on items related to child characteristics approached significance (p=.1), with the fathers in the Family Intervention project reporting higher levels of stress. Most of the difference in the Child Domain subscale can be accounted for by higher scores on Adaptability (p=.04), and to a lesser extent Acceptability (p=.11).

Differences in the Parenting Domain were largely associated with a single subtest. Fathers in the present sample obtained significantly higher scores for Isolation (p=.05).

In summary, the results of the PSI suggest that this group of parents of handicapped children was experiencing significantly more stress than the normative sample. Further, this stress was associated primarily with specific child characteristics. No significant difference was found in the total level of stress from all sources reported by mothers compared to fathers. However, mother/father differences did exist in stress related to the parenting role. Mothers in the present sample reported greater feelings of depression, as well as higher levels of stress associated with the spousal relationship. Somewhat unexpectedly, fathers appeared to feel more isolated than their spouses.

While levels of stress for both the present sample, and a previous study involving the families of young handicapped children (Reddon, 1989) were remarkably similar, some differences in the pattern of this stress are worth noting. Mothers participating in the Family Intervention Project felt less restricted by their parental responsibilities. Fathers, on the other hand, experienced more isolation and appeared to associate a higher level of stress with child adaptability than their counterparts in the Reddon (1989) study.

Measures Family Resources

Research Question 2a

> Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences on measures of resources perceived to be available to the family (BB factor)?

The Family Inventory of Resources for Management (FIRM) was used in the present study as a measure of the BB Factor in the T-Double ABCX Model of family adaptation. The BB Factor involves the families' perceptions of the strengths, and resources it can call upon at any given time (McCubbin, & Thompson, 1987). The FIRM is composed of six subtests: Family Strengths I: Esteem and Communication, Family Strengths II: Mastery and Health, Extended Family Social Support, Financial Well-Being, Sources of Financial Support, and Social Desirability. The first four subtests may be combined to give a single index of family resources. Unfortunately, norms based on families of nonhandicapped children are not reported in the manual (McCubbin, & Thompson, 1987). The FIRM was normed on a group 322 families with children afflicted with either cerebral palsy, or mylomenengocele.

In total, seven fathers and eight mothers completed the FIRM individually. In two families, a single FIRM was completed jointly by both partners. These two families were excluded from the mother/father comparisons. Mean scores for total resources, and each of the subtests are presented in Table 10. Means for both the normative sample and the Reddon (1989) are included in this study to allow for comparisons between each of these samples. Methods of analysis were limited by the size and nature of the sample. Description, visual analysis using box and whisker plots and Irwin Fisher Two Sample Median Tests are used in the mother/father comparisons.

The mothers in this sample obtained mean total resource scores of 113, with a standard deviation of 30.1 and a range of 62 to 149. This mean is marginally higher, but still within one standard deviation of the normative sample (mean=110, standard deviation=18). All subtest scores on the FIRM were also within a standard deviation of the comparison group. The greatest difference in subtest scores between the mothers in the present sample and the normative sample was on a measure of financial well-being. Mothers in the present sample reported feeling more secure financially (i.e. 34 versus 29 in the normative sample).

The mean resource scores for fathers involved in the Family Intervention study were higher than both the mothers in the present sample, as well as mean scores for the normative study (i.e.119.1, versus 110). While scores for each of the subtest scores that make up the FIRM are quite similar to the normative sample, some differences are worth noting.

Fathers involved in the present study obtained scores on Financial Well-Being in excess of one standard deviation above the mean for the normative sample (i.e. 40.6 , versus 29). In addition, mean scores on Family Strengths II: Mastery and Health, were

TABLE 10

Means, Standard Deviations and Statistical Significance of Scores (p) for Mothers and Fathers on Family Inventory of Resources for Management (FIRM).

Mothers/Fathers	Family Intervention Project			Normative*	Reddon (1989)
FIRM Score	Range	Mean	Deviation	Mean	Mean
Family Strengths I:	22.0	34.6	7.5	35.0	38.4
Esteem/Communication	11.0	36.6	3.7		
Family Strengths II:	33.0	36.3	14.1	39.0	40.1
Mastery/Health	27.0	34.0	9.7		
Extended Family	7.0	8.2	3.2	9.0	9.7
Social Support	9.0	8.0	4.2		
Financial Well-being	31.0	34.0	10.1	29.0	34.5
	14.0	41.0	5.7		
Sources of Financial	5.0	5.3	1.7	5.0	5.0
Support	3.0	5.1	1.1		

TABLE 10 CONTINUED

Social Desirability	13.0	11.1	4.2	12.0	12.8
	12.3	12.3	3.7		
FIRM Total	87.0	113.0	31.0	110.0	
	58.0	119.1	19.2		

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* Families with children with either cerebral palsy, or mylomenegocele (McCubbin & Thompson, 1987)

somewhat lower than the normative mean for that subtest (i.e. 34, versus 39 for the standardization sample).

With one exception, the mother/father comparisons involve husband and wife pairs. As a result, differences in perceptions of available resources were predictably quite small. Visual analysis of mean total resource scores using box and whisker plots (Figure1) indicate considerable similarities in terms of central tendency and spread of the data. Of the subtests, the fathers' mean score for Financial Well-Being was noticeably higher (i.e. 40.6, versus 34 for mothers). This difference was likely due to the score obtained by the single mother in the group.

Irwin Fisher Two Sample Median Tests for equality of proportions were conducted on each of the subtests. Following Marascuilo and McSweeney's (1977) recommendation scores tied at the median were assigned to render the test conservative with respect to the rejection of the null hypothesis. At the .05 level of significance the null hypothesis would be rejected if the porportion of fathers falling above the common median exceeded 5. Differences of this magnitude were not observed between the mothers and fathers in the present study.

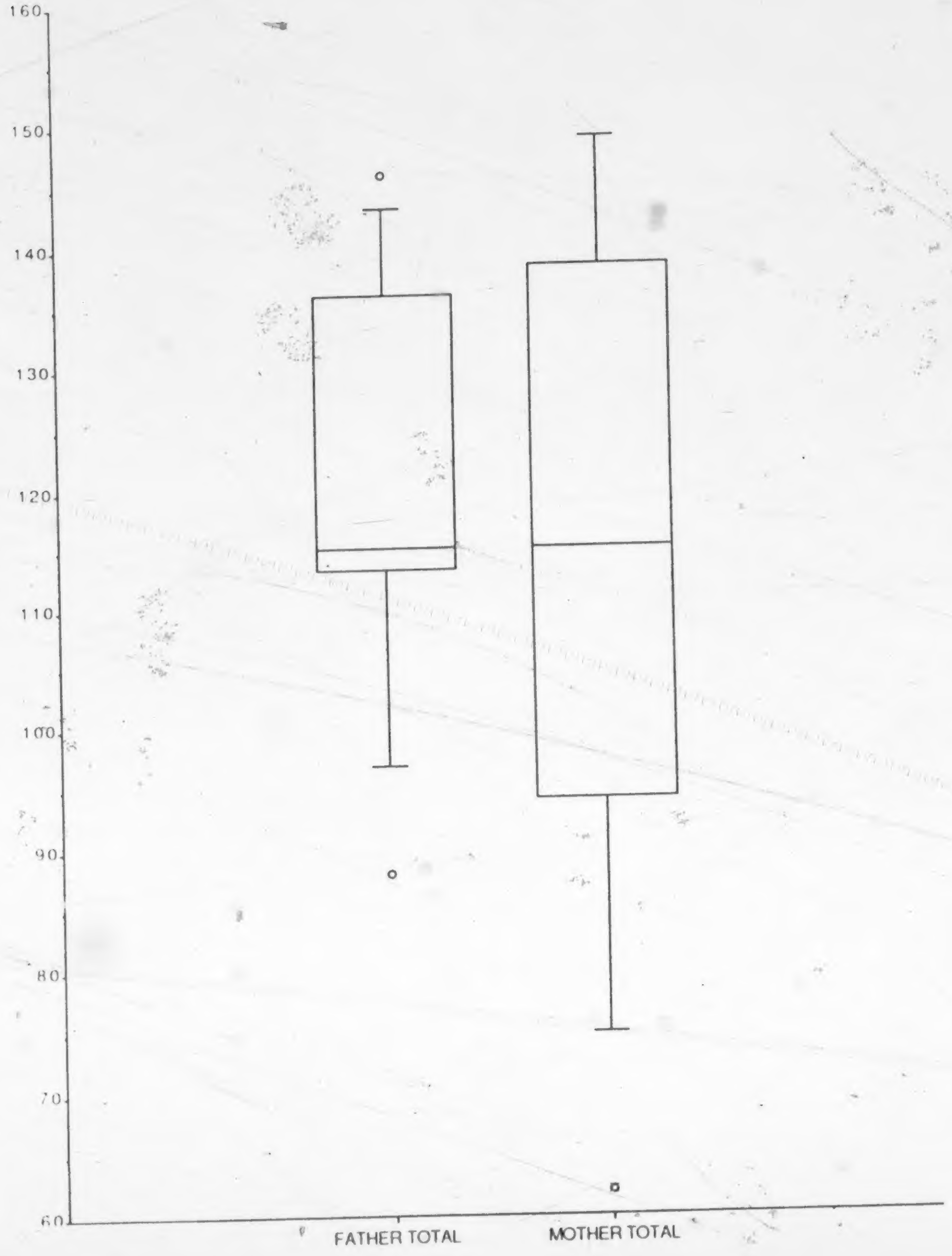
Generally the results of the FIRM indicate that the participants in the project reported a reasonably high level of family resources compared to the families of chronically ill children. The fathers, in particular, appeared to feel a greater sense of financial security, along with a slightly lower sense of mastery and physical well-being compared to the normative sample.

Research Question 2b

> Do parents of young handicapped children who express an interest in becoming involved in stress intervention, differ significantly from a similar group of parents not involved in intervention, on measures of their perception of resources?

FIGURE 2

MOTHER /FATHER COMPARISON OF TOTAL SCORE FOR THE FIRM



A final comparison was made between the mean scores in the present sample and those obtained by Reddon (1989). Since, in this prior investigation, the FIRM was completed jointly by both parents, the scores of both mothers and fathers for the present sample were combined. Differences in the Mean total resource scores were marginal (117.8, versus 122.6). Sources of Financial Support and Financial Well-Being were slightly higher in the present sample. The remaining subtest scores were marginally lower with the exception of Family Strengths I: Esteem and Communication which was more than one standard deviation below those obtained by the Reddon group. This suggests that relative to a similar group of parents with handicapped preschool children, the mothers and fathers in the present sample reported lower levels of family esteem and ease of communication between family members.

In summary the present sample demonstrated a great deal of similarity to other parents of handicapped children in terms of the resources they perceived as being available to them, with a few notable differences. Both mothers and fathers in the present group reported higher levels of financial resources, which appears to be in agreement with the demographic data reported earlier. Both mothers and fathers also reported lower levels of family esteem, communication and support.

Measures of Social Support

Research Question 3a

> Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences on measures of social support believed to be available to them (BBB Factor?)

There is a substantial body of literature that identifies social support as a critical mediating factor in the perception of stress in families with handicapped children (Bristol, 1987; Dunst et al.,1988; Friedrich et al.,1987). Within the T-Double ABCX Model of family adaptation, social supports are subsumed under community resources, and supports (BBB Factor). The instrument used to measure social support in the present study was the Social Support Inventory (SSI). This instrument was designed originally to measure the social support network of parents with young children (McCubbin, & Thompson, 1987).

Conceptually, the SSI is organized into five types of support, including: emotional, esteem, network, appraisal, and altruistic. These types of support are derived from twelve sources: spouse, children, relatives, friends coworkers, church/synagogue, spiritual beliefs, community groups, professionals, special groups, TV/books, and other sources. The SSI provides scores for each of the types and sources of support. In addition, a total support score can be derived by summing each of the sources.

Since there is little normative information available, this discussion will involve descriptions of the results obtained, and an analysis of differences between the mothers and fathers in the present study. Descriptive data in the forms of means, ranges, standard deviations and statistical comparisons between mean scores for mothers and fathers on the SSI are presented in Table 11. To assist in the discussion of results, the twelve sources of support are categorized into family support, informal community support, formal sources of support, and miscellaneous sources. Again, all statistical comparison of means involved two-tailed t-Tests for uncorrelated samples.

In total 10 fathers and 11 mothers completed the SSI. With reference to family sources of support, both mothers and fathers in the sample appeared to obtain similar levels of support from their spouse, children, and relatives (i.e., Spouse p.=.55, children p.=.26, Relatives p.=.32). Levels of support were also quite similar for religious sources such as the individuals' place of worship (p.=.48), and spiritual beliefs (p=.35). The pattern of support obtained from informal sources was quite different for mothers as compared to the fathers in the sample. Mothers reported significantly less support from co-workers (p=.05), while obtaining relatively more support from friends (p=.07). In addition, mothers appeared to derive

TABLE 11

Means, Standard Deviations and Statistical Significance (p) of Scores for Mothers and Fathers on the Social Support Inventory (SSI)

Mothers/Fathers	Family Intervention Project				Reddon(1989)
SSI Score	Range	Mean	Deviation	p	Mean
Spouse	9	11.5	4.0	.55	13.3
	6	12.3	2.0		13.3
Children	8	11.5	2.9	.26	11.9
	6	10.4	2.2		11.9
Relatives	10	10.5	3.6	.31	11.9
	9	9.4	2.7		11.0
Friends	10	11.4	2.9	.07	12.3
	8	9.6	2.1		10.0
Co-workers	6	6.6	2.5	.05	7.8
	7	8.3	2.6		10.0
Church/Synagogue	5	6.0	1.8	.48	7.6
	4	5.6	1.4		6.1
Spiritual Beliefs	8	9.6	2.5	.35	8.7
	8	8.9	2.4		8.7
Community Groups	4	6.1	1.7	.56	6.5
	6	6.4	2.2		6.8

TABLE 11 CONTINUED

Professional Groups	7	9.1	1.8	.004	9.1
	6	7.1	2.3		7.2
Special Groups	6	8.2	2.2	.10	7.6
	6	7.0	2.5		7.3
TV/Books	5	7.3	1.9	.70	6.4
	6	7.5	2.6		5.8
Other	6	5.5	1.8	.34	5.0
	0	5.0	0.0		5.1
Total SSI	34	103.4	13.5	.19	107.8
	52	97.6	14.8		103.1

Note. Statistical significance for mean difference was obtained from a 2-tailed t-test for independent samples.

more support from formal sources within the community. Mothers obtained significantly higher mean scores related to professional services (p=.004).

Fathers generally reported somewhat less support from most sources. Co-workers were the only source from which the fathers mean support score was significantly higher than that of the mothers (p=.05). This difference likely reflects the fact that fewer mothers were employed on a full-time basis.

Given that total scores on the SSI can range from 60 to 180, both mothers and fathers in the present sample were reporting a moderate level of support at best. Both parents appeared to drive similar levels of intrafamilial social support. Mother-father differences emerged relative to extrafamilial support. Mothers appeared more likely to turn to friends and professionals for support, while fathers obtained somewhat higher levels of support at the workplace.

Research Question 3b

> Do parents of young handicapped children who express an interest in becoming involved in stress intervention, differ significantly from a similar group of parents not involved in intervention, in the amount of social support perceived to be available to them?

The mothers in the present sample, and the mothers in the recent study by Reddon (1989) demonstrated a very similar pattern of support as measured by the SSI. Differences between the two groups of mothers were not statistically significant for total support scores. In addition, differences between mean scores obtained for the individual sources of support were, with one exception, non-significant. Mothers in the present sample were less likely to derive support from community and neighborhood groups (.02).

Similarly, no significant differences were found between mean total support scores for the fathers in the present sample and the fathers studied by Reddon (1989). Despite the fact that none of the subtest scores related to sources of support were significantly different at a .05 level, some of the scores are discrepant enough to warrant discussion. Fathers in the present sample reported somewhat less support from family sources, including children (p.=.1), and relatives (p.=.1). In addition, this group of fathers also appeared to obtain less support from co-workers (p.=.07). This latter finding is perhaps not surprising given the fact that, unlike the Reddon study, not all the fathers in this sample were fully employed at the time of assessment.

In summary, a common pattern of social support appears to emerge from two samples of parents with handicapped preschool children. In terms of mother/father comparisons in the present sample, both mothers and fathers appeared to derive more support from intrafamily sources, than from sources outside the family. Mothers, however, appeared to rely on external sources such as friends and professional sources to a greater extent. Fathers, on the other hand, reported more support from co-workers.

Although the pattern of social support for mothers and fathers is quite consistent with the results of the previous study (Reddon, 1989), some differences in actual levels of support were obtained. Mothers in the Family Intervention project appeared to derive less support from community and neighborhood groups, while fathers in the present study reported somewhat less support from children, relatives, and co-workers.

Finally, it is worthwhile noting that the parents in this sample were reporting moderate levels of support at best. Total possible support score for the SSI is 180, as noted previously however, the means for the fathers and mothers in this sample were 97.6, and 103.4 respectively. In addition, four of those mothers and six of the fathers reported total support scores of less than 100.

Measures of Problem-Solving and Coping Skills

Research Question 4a

> Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences in their perception of coping behaviors they employ to manage family life (PSC Factor)?

Within the T-Double ABCX Model of family adaptation, the pile-up of stressors may be mediated by family and personal resources, situational appraisals, and social supports. Another critical variable in the perception of stress, related to parental characteristics, is the problem-solving and coping skills of the individual parent (McCubbin and Thompson, 1987). The function of parental coping is to "restore the balance between demands and resources" (McCubbin, and Thompson, 1987, p.22)

The Coping Health Inventory for Parents (CHIP) was used as a measure of the PSC factor in the present study. The CHIP is a self-report instrument that is designed to measure a parents' response to the management of a seriously ill child. The CHIP loads on three factors, which have been identified as major patterns of coping (McCubbin, and Thompson, 1987). The CHIP was normed and validated on a group of 308 parents of seriously/chronically ill children. The means and standard deviations derived from this study are the only available normative data. Scores obtained for mothers and fathers in the present study will be compared to this normative data. Means, standard deviations, ranges and statistical comparisons between mothers and fathers are presented in Table 12. Means from both the normative sample, and the Reddon (1989) study are included in this table for comparative purposes.

Coping Pattern I measures the degree of interdependence of family relationships, in the face of stress and the parents' appraisal of the situation. Mean scores for the mothers in the sample were comparable to those obtained for the mothers in the normative sample (i.e. 37.2, versus 40.0 for the normative sample). Fathers scores on Coping Pattern I, were also very similar to those reported for parents of

TABLE 12

Means, Standard Deviations and Statistical Significance (p) of Scores for Mothers and Fathers on the Coping Health Inventory for Parents (CHIP)

Mothers/Fathers	Family Intervention Project				Normative**	Reddon (1989)
CHIP Score	Range	Mean	Deviation	p*	Mean	Mean
Coping Pattern I:	28.0	37.2	8.7	.13	40	35.5
Integration/Optimism/ Cooperation	29.0	31.3	9.8		36	33.3
Coping Pattern II:	35.0	29.1	9.9	.20	28	30.6
Support/Esteem/ Stability	33.0	23.8	9.3		25	26.1
Coping Pattern III:	14.0	16.2	3.8	.18	15	14.1
Medical Understanding	17.0	13.5	5.6		12	10.3

* Obtained from a sample of Parents of chronically ill children.

**Statistical significance for mean difference was obtained from a 2-tailed t-test for independent samples.

chronically/seriously ill children (i.e. 31.3, versus 36 for the normative sample). While not statistically significant mothers' responses to the items on this scale were slightly higher than the fathers (p=.13).

Coping Pattern II measures the parents' efforts to maintain relationships with others, as well as their own self-worth, while managing stresses and tensions. Mean scores for mothers in this sample were virtually identical to those reported by McCubbin and Thompson (1987).

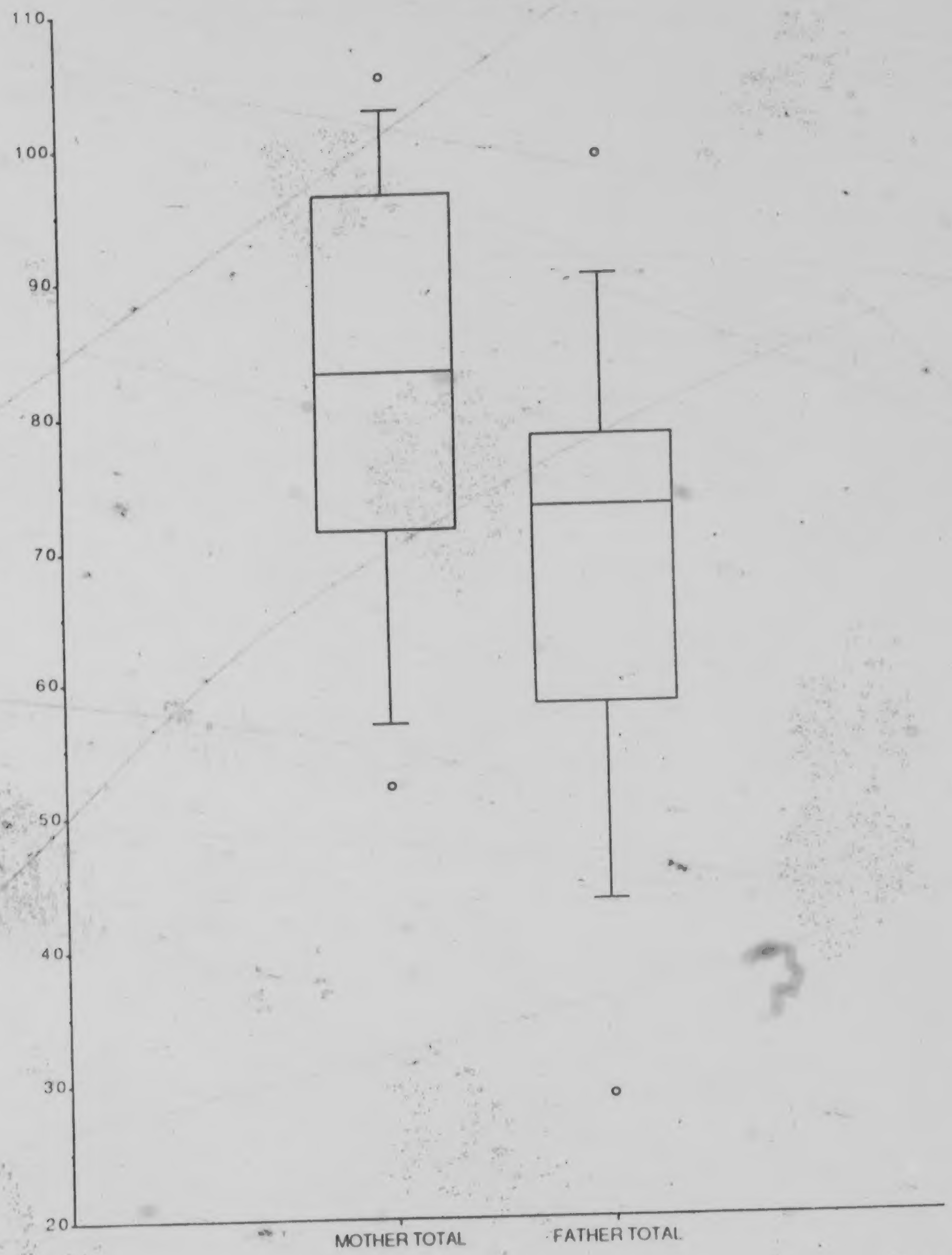
The final coping pattern (Coping Pattern III) examines the parents efforts to become more knowledgeable about their child's condition, and if necessary to master any medical treatments. Comparisons noted for Coping Patterns I, and II were repeated on this subscale. The mean scores for both mothers and fathers in the current study matched that of the normative sample. Mothers obtained scores that were somewhat higher than fathers mean scores (p=.18)

With respect to the total coping score, the mothers in the present sample appeared to utilize comparatively more coping skills than their male counterparts. In a one sample comparison of means, mother/father differences approached significance (p=.07). Visual inspection of the data using a box and whisker plot (Figure 3) suggested very little overlap in the scores falling between the first and third quartiles. An Irwin Fisher Two Sample Median Test also indicated a considerable degree of difference in the porportions of mothers whose total coping scores fell above a common median (p=.06). Hence mothers appeared to report using a greater number of coping skills than fathers.

Generally, the parents in the Family Intervention group were not appreciably different, with respect to coping behaviors, than the normative sample. It should be noted, however, that the normative sample involved parents of chronically/seriously ill children. McCubbin and Thompson (1987), suggest that parents of multihandicapped children demonstrate a pattern of coping that is distinct from the normative sample. These authors reported that in a study of 40 parents of multiply handicapped children

FIGURE 3

MOTHER/FATHER COMPARISONS OF TOTAL SCORES FOR THE CHIP



mean scores for Coping Pattern III: Medical Knowledge were markedly lower than that of the parents with seriously/chronically ill children, while the mean score for Coping Pattern II: Social Support, Esteem, and Psychological Well-Being were higher. In the present study, the scores on the Coping Pattern III were actually marginally higher than the normative sample.

Research Question 4b

> Do the parents of young handicapped children who express an interest in becoming involved in stress intervention, differ significantly from a similar group of parents not involved in intervention, in their perception of coping behaviors they employ to manage family life (PSC Factor)?

The pattern and levels of coping skills reported by the family intervention group were, on the whole, very similar to those reported by parents involved in the Reddon study. Differences approaching statistical significance were obtained for both mothers and fathers on Coping Pattern III: Medical Understanding (i.e., p.=.08 for mothers and p.=.10 for fathers). Parents in the present study reported greater use of this coping pattern than their counterparts in the earlier study (Reddon, 1989).

In summary, the parents in the present investigation were quite similar to the normative sample, as well as the prior study by (Reddon, 1989), in terms of two of the three major coping patterns measured by the CHIP. There is evidence, however, that the parents participating in the Family Intervention Project utilized Coping Pattern III: Medical Understanding to a greater extent than the parents in either comparison group. This coping pattern involves behaviors directed at maintaining relationships with health care professionals and the parents of other children with special needs. In addition, a nonsignificant trend suggested that mothers in the present sample use a greater number of the total coping behaviors measured by the CHIP, compared to fathers.

Measures of Appraisal

Research Question 5

Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences on measures of beliefs related to child development (CC Factor)?

Within the T-Double ABCX Model the role of appraisal is recognized as an important contributing factor to the familys' adaptation to a chronic stressor. Appraisal within this framework occurs at several levels. Appraisal can involve a given event, it can be more general involving the familys' estimation of demands in relation to its' capabilities, or it can be more global involving the appraisal of the familys' interrelationships, as well as the relationship of the family unit to the larger community (McCubbin & Thompson, 1987).

A measure of this last level of appraisal was included in the present study. The Concepts of Development Questionnaire (CODQ) is a twenty item self-report measure that is intended to assess parental beliefs about child development (Sameroff, & Feil, 1985). The items that make up the CODQ load on two factors, categorical and perspectivistic thinking. Three scores are obtained from the CODQ, a Perspectivistic Score, a Categorical Score and a total score. Mean scores on each of these scales can range from 0 to 3 indicating the individuals position relative to these two extremes of parental beliefs about development.

Normative information on the CODQ is quite limited. A standardization study was conducted on 80 mothers with preschool children. The sample was stratified into five SES levels based on the Hollingshead Two Factor Index of Social Position (1958). Means are reported for Categorical, Perspectivistic, and total scores, at each of the SES level. Standard deviations, and ranges are not reported by the author.

The analysis of the results from the present study will be limited to comparisons between the mothers and fathers in the sample. It should be noted that some of the subjects in the sample declined or neglected to respond to every item on the CODQ. In those cases where less than 80% of the items were completed for either scale the questionnaire was excluded from the analysis. If 80% or more of the items were completed the mean value for that scale was assigned to the unanswered item. Assigning the mean value for the scale avoids the possibility of artificially lowering scores because of non response. Means, standard deviations, ranges and mother/ father differences are presented in Table 13.

Items related to the categorical thinking are concerned with the identification of children with a label, and the tendency to view developmental outcomes as the result of unitary causes (Sameroff & Feil, 1985). Fathers in the sample obtained a mean Categorical Score of 1.04, with a standard deviation of .19, and a range of .6 to 1.4. A mean Categorical score of .88 for mothers was somewhat lower. Mothers scores on this scale ranged between .2 and 1.5 indicating a considerable degree of spread.

While the difference in mean scores is not statistically significant (p.=.24), visual analysis using box and whisker plots (Figure 4) suggests that there may be notable differences in the variability in mothers' attitudes toward development when compared to the fathers in the sample. Fathers' scores were highly concentrated around the median with very little spread. Mothers' scores on the other hand were spread relatively evenly between the two extreme scores.

In contrast to categorical views on development, items related to perspectivistic thinking present developmental outcomes as an instance of a set of several possible outcomes. In addition, perspectivistic items also describe the family as a network of dynamic, reciprocal relationships (Sameroff & Feil, 1985). Mothers in the present sample obtained a mean score of 2.14, with a standard deviation of .3, and a range of 1. Fathers' mean score of 1.98 on the Perspectivistic scale was somewhat lower (p=.12).

The total score is obtained by combining the perspectivistic score, with the amount of disagreement with categorical items. Total scores for the sample reflected the pattern reported for the Perspectivistic scores with the mothers demonstrating

TABLE 13

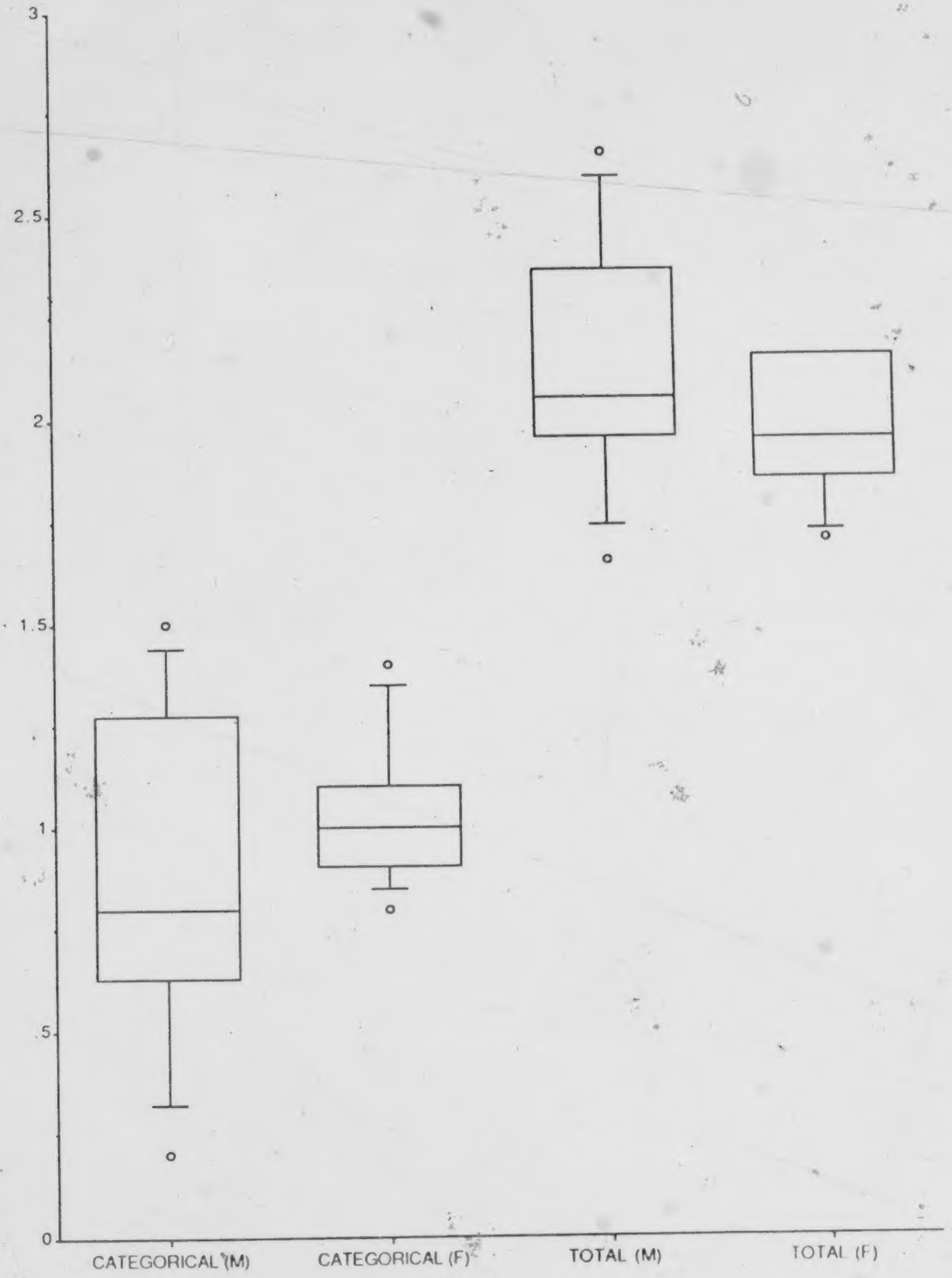
Means, Standard Deviations and Statistical Significance (p) of Scores for Mothers and Fathers on the Concepts of Development Questionnaire (CODQ).

Mothers/Fathers CODQ Score	Range	Mean	Standard Deviation	p
Categorical Thinking	1.3	.88	.40	.24
	.6	1.04	.20	
Perspectivistic Thinking	1.0	2.14	.30	.12
	.7	1.98	.23	
CODQ Total	1.0	2.13	.31	.12
	.5	1.97	.17	

Note. Statistical significance for mean difference was obtained from a 2-tailed t-test for independent samples.

FIGURE 4

MOTHER (M)/ FATHER (F) COMPARISONS FOR THE CODQ



somewhat higher mean scores than fathers (2.13, versus 1.97, p=.12). The mothers mean total score on the CODQ corresponded to that obtained for the middle SES group in the standardization sample. The fathers mean total score was most similar to the second lowest SES group, however, it should be noted that no fathers were included in the normative study.

In summary, while there was considerable individual variability, this group of parents generally demonstrated a tendency towards perspectivistic views on development. The variability in the data suggests that meaningful differences in beliefs about development might exist between mothers and fathers despite the lack of statistically significant results. Fathers' Categorical scores were on the whole, more uniform, and lower than that of the mothers in the sample. Mothers on the other hand demonstrated more variability in Categorical thinking along with marginally higher Perspectivistic thinking scores. These results tend to indicate that the fathers in the present investigation may have held a somewhat more rigid view of child development.

It is important to note that these summary statements are made in reference to the data available from the present study only. In a series of studies Sameroff and Feil (1985) have found evidence that concepts about development are strongly related to both socio-economic status (SES) and culture. In the North American context Perspectivistic thinking tends to increase with SES. The trend towards perspectivistic thinking in the present sample is therefore not surprising, and may in fact be somewhat lower than expected. A lack of sufficient data about the normative sample, however, precludes direct comparisons.

Measures of Family Adaptation

Research Question 6a

Did the mothers and fathers of handicapped children involved in the Family Intervention Project demonstrate significant differences on a measure of family adaptation (XX Factor).

McCubbin and Thompson (1987) describe family adaptation as the "outcome of family efforts to achieve a new level of family balance and fit after a family crises"(p. 15). In the present study an indication of family adaptation was provided by the Family Assessment Measure (FAM).

The FAM is a self-report instrument that provides quantitative information on the family's strengths and weaknesses . The FAM has three major components: 1) a Self-Rating Scale which taps the individuals perception of his or her functioning in the family, 2) a Dyadic Relationships which examines relationships between specific pairs, and 3) a Self-rating scale which taps the individuals perception of his/her functioning in the family (Skinner et. al., 1983). Each of these scales contains seven subscales related to family functioning including: task accomplishment, role performance, communication, affective expression, affective involvement, control and values and norms. The FAM, therefore attempts to provide a comprehensive assessment of family functioning from three different perspectives.

The seven subscales can be combined to provide a mean score for that scale. This mean score serves as general index of the degree of health/pathology of family functioning (Skinner, et al., 1984). Detection of response styles is provided by two additional subscales attached to the general scale (Social Desirability and Defensiveness). Raw scores on the FAM can be converted to standard scores with a mean of 50 and a standard deviation of 10. The manual suggests that most of the scores should fall between 40 and 60. Scores in excess of 60 could indicate a serious disturbance in family functioning, while scores less than 40 are suggestive of very healthy family functioning (Skinner, et al., 1984).

The FAM was used in the original research plan as an outcome measure to be administered following each intervention. In the context of the present study the FAM will be used for descriptive purposes.

The FAM was completed by six mothers all of whom completed at least one component of the intervention. Of the seven fathers who completed the FAM, three participated directly, while four were spouses of the participants. Descriptive statistics for mothers and fathers in the present sample, as well as the means from the Reddon study are presented in Table 14, while the means of participants and non participants are presented in Table 15. A visual comparison of mothers and fathers scores is provided in Figure 5. It should be noted that two of the mothers who participated in the intervention failed to return the response sheets.

Means for both mothers and fathers on the general form were well within the non-clinical range. Fathers obtained a mean of 48.0 with a standard deviation of 6.6 and a range between 34.6 and 53.6. While mean scores for mothers were very similar at 48.6, a range of between 32.0 and 64.9, along with a standard deviation of 11.4 suggests a greater degree of variability in the mothers scores (see Figure 5). Of the thirteen parents who completed the FAM only one, a mother, obtained a score in excess of 60 indicating significant difficulties in the family relationship.

Mean scores for both mothers and fathers fell below the normative mean on the Social Desirability and Defensiveness subscales. In addition, the fact that none of the individual scores exceeded 60 on these two scales supports the validity of these results.

The Dyadic Scale was used to measure the individuals level of satisfaction with the functioning of their spouse within the family system. Mean scores for both the mothers and the fathers in the sample were virtually identical (i.e. 46.7 for mothers versus 46.8 for fathers). Fathers scores ranged between 34.6 and 56.3, with a standard deviation of 8.2. A standard deviation of 12.2, and a range between 31.1 and

TABLE 14

Means, Ranges and Standard Deviations of Scores for Mothers and Fathers on Family Assessment Measure (FAM).

Mothers/Fathers	Family Intervention Project			Reddon (1989)
FAM Score	Range	Mean	Deviation	Mean
General Scale	32.9	48.7	11.4	48.8
	19.0	48.0	6.6	47.9
Dyadic Scale	30.6	46.8	12.2	46.6
	21.7	46.6	8.2	46.9
Self-Rating Scale	33.0	48.7	11.8	48.0
	15.3	50.5	5.6	47.4

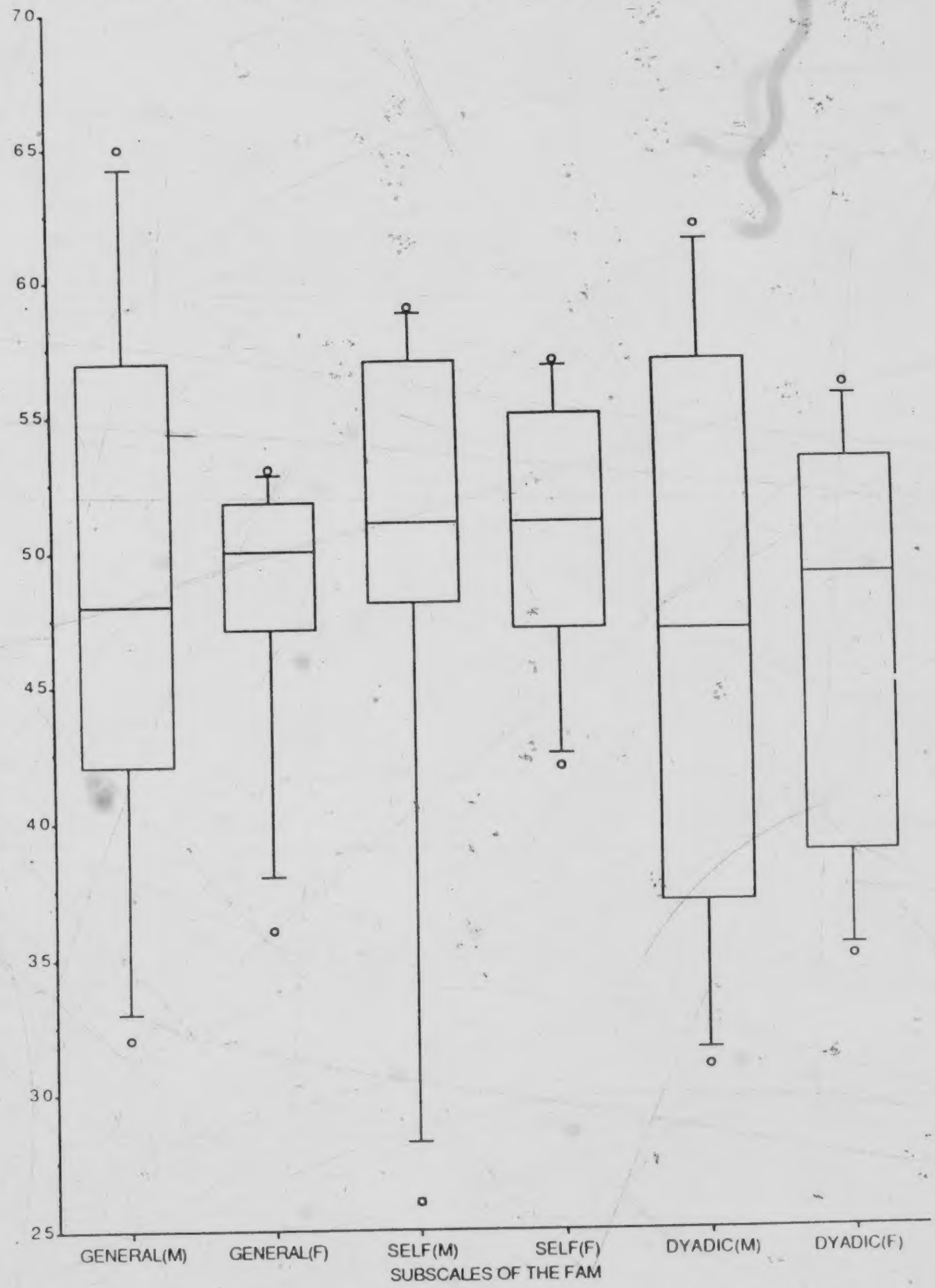
TABLE 15

Comparison of Mean Scores for the Participants and Non-participants on the Family Assessment Measure (FAM).

	Fathers		Mothers	
Participants	(n=3)		(n=4)	
	General	50.8	General	48.7
	Dyadic	53.7	Dyadic	46.8
	Self-Rating	47.6	Self-Rating	46.8
	Mean	50.7	Mean	47.4
Non-participants	(n=6)		(n=0)	
	General	46.2	General	
	Dyadic	48.6	Dyadic	
	Self-Rating	45.9	Self-Rating	
	Mean	46.9		

FIGURE 5

MOTHER (M)/ FATHER(F) COMPARISONS ON THE FAM



62.2 indicates a greater degree of variability in maternal assessment of their partners functioning.

An indication of the individual's perception of their own functioning within the system is provided by the Self-Rating Sale of the FAM. Again the pattern evident in the previous scales is repeated for the Self-Rating Scale. The mean score for both fathers and mothers was at, or below the normative mean (48.7 for mothers, versus 50.4 for fathers). Variability of the mothers scores was greater with a standard deviation of 11.8, compared to 5.6 for fathers. None of the parents completing this portion of the FAM obtained a score in excess of the non-clinical range.

Somewhat surprisingly, while well within the normal range, mean scores on each of the scales of the FAM were marginally higher for the three fathers participating directly in the intervention.

Research Question 6b

> Do parents of young handicapped children who express an interest in participating in stress intervention, differ significantly from similar group of parents not involved in intervention on measures of family adaptation (XX Factor)

A comparison with the results of the Reddon (1989) study suggests that the parents in the Family Intervention Project obtained virtually identical mean scores for each of the scales of FAM. With one exception mean scores for the fathers and mothers in both investigations were within a single standard score on all three scales. The exception involved the mean score on the Self Rating Scale. This score was marginally higher for fathers in the present sample (i.e. 50.5., compared to 47.4).

In summary the results of the FAM did not suggest high levels of family dysfunction despite the presence of a handicapped child in the family. None of the mean scores obtained on any of the subscales exceeded the normative mean. Only two of the participants, both mothers, reported significant problems related to family functioning.

Consistent with the results of the Reddon (1989) study differences in the means obtained for the mothers compared to the fathers' mean scores on the FAM were marginal. Also in agreement with this previous study, the degree of variability in the scores was greater for the mothers in the sample.

In summary the results of the FAM tend to suggest an adequate level of adaptation and functioning within this group of families. Mean scores for both fathers and mothers, as well as participants and nonparticipants were within the nonclinical range. Fathers who participated in the intervention obtained marginally higher mean scores across all three scales.

It should be noted, however, that inferences about the level of family adaptation apply only to those families where one, or both, of the spouses completed at least one phase of the intervention. In addition, two of the mothers who completed the intervention failed to return the FAM. The effect that these factors have on the representativeness of these results is unclear.

Summary and Integration of Descriptive and Self-Report Data

Demographic data indicated that the parents involved in this study were mature, typically in their thirties, and relatively well educated. As a group they could best be described as occupying a moderately high, to high SES level. However, there was considerable variability in income and educational levels. For example, within this sample there were two single mothers, as well as three unemployed fathers. Income levels ranged from below $10,000 per annum to in excess of $60,000

The mothers and fathers involved in this study reported high levels of stress, total PSI scores for both parents exceeded the 80th percentile. Fathers in particular reported very high stress levels compared to the fathers of nonhandicapped children. More than a third of the mothers and fathers in the present sample obtained scores high enough to warrant professional referral.

Much of the stress experienced by these parents seems to be related to child characteristics. Child Domain scores for both mothers and fathers in the sample fell above the 95th. percentile. Factors such as the demandingness, adaptability, and acceptability of the child appeared to make the most significant contribution to this stress.

With one exception, mothers involved in the Family Intervention Project appeared to be very similar to their counterparts in the Reddon (1989) study, in terms of pile-up of stressors. The mothers in the present sample appeared to feel less restricted in the parenting role.

There were also differences worthy of note between the fathers involved in both the present investigation and Reddon's (1989) data. In comparison to the prior study the fathers in the Family Intervention Project perceived the characteristics of their child to be somewhat more stressful, and felt significantly more isolated.

Perhaps predictably, both mothers and fathers derived their greatest emotional support from their families. Mothers, however, were more likely to seek support from friends and professional sources, while fathers reported obtaining significantly more support from co-workers. While this pattern is generally consistent with the results of the Reddon (1989) study, there were some notable differences particularly for the fathers. Fathers involved in the Family Intervention Project seemed to derive somewhat less support from children, relatives, and coworkers compared to the previous study.

In the absence of information about levels of social support experienced by the parents of nonhandicapped preschool children, conclusions about the total level of support, reported by the present sample must remain speculative. Mean support scores on the SSI for both mothers and fathers suggest, however, that these parents experience a moderate level of social support at best.

Similarly, the lack of data on families with non-handicapped children hampers the interpretation of the pattern of coping skills (PSC Factor) and resources (BB

Factor) obtained for the parents in the present sample. Nonetheless, these parents were generally quite similar to families with seriously/chronically ill children, with a few differences worthy of note. In terms of resources the parents in this sample obtained somewhat higher scores on a measure of financial well-being. Relative to the Reddon (1989) study these parents also appeared to experience less family esteem, and more difficulty communicating with each other.

With reference to coping skills, the results obtained for the present sample are generally consistent with both a prior study involving the parents of multihandicapped children (Reddon, 1989) and families of chronically/seriously ill children (McCubbin & Thompson, 1987). There is evidence from the results of the CHIP, however, that the parents participating in the Family Intervention Project utilized one particular coping pattern to a greater extent than either of these comparison groups. This pattern involves the acquisition of medical knowledge related to the child's condition and communicating with other parents in similar circumstances.

Group analysis of parental beliefs about development suggest that the parents in the present investigation held views on development that were oriented towards perspectivistic thinking. Fathers appeared to be somewhat more rigid and categorical in their thinking, while mothers demonstrated more variability in the scores obtained on the CODQ.

Generally the results of the FAM tend to suggest that the parents participating in the interventions enjoyed a relatively desirable level of family adaptation. While the mean scores for all three scales were well within the normative range, and very similar to the results of the prior study, two of the parents obtained scores indicative of family dysfunction. In addition, nonresponse may have adversly affected the representativeness of these data.

In summary, the results of these self-report measures indicate that the parents who participated in the Family Intervention Project demonstrated a pattern of stress and supports generally quite similar to those families studied previously by Reddon (1989). Further these results also tend to support the use of the interventions chosen for this study. Parental perception and response to the child characteristics of demandingness, distractibility, hyperactivity, and acceptability, appear to be appropriate targets for stress management training, and enhancement of parent-child interaction. In addition, the trend towards greater utilization of Coping Pattern III: Medical Understanding by this sample also adds support to the use of a peer group format.

Intervention Effects on Self-Report Measures

The following section deals with the reporting and analysis of self-report measures collected prior to and following each of the interventions. This portion of the results will be presented in three subsections. The first subsection will involve a comparison of the results of self-report measures taken before and after stress management training, while the second subsection will compare these data following the the natural teaching strategies component of the intervention. These comparisons will provide some indication of the effectiveness of each of the specific treatments. In the final segment, baseline data will be compared to the data collected following the second intervention, regardless of whether that intervention involved stress management training or natural teaching strategies.. Analysis of data collected at these points will help to determine if the interventions had an impact on self-report measures that cannot be accounted for by the content of either intervention alone.

This analysis of the self-report measures involves both visual and statistical procedures. Statistical analysis consisted of t-Tests for Dependent Samples when the numbers of paired observations equaled or exceeded ten. Calculation of t-tests was carried out on Stat View 512+ (Feldman & Gagnon, 1986). A visual analysis using box and whisker plots was completed on total scores and selected subtest scores where the number of subjects precluded a statistical comparison of means.

Since there is evidence in the literature that these interventions have been successful in reducing stress reported by the parents of handicapped children (Singer, 1988), a one tailed test of significance was employed. The discussion of results will begin with the effects of stress management training on the various measures related to different components of the T-Double ABCX Model.

Effects of Stress Management Training

Research Question 7a

What is the effect, if any, of group intervention involving stress management training on measures of Pile Ups, Social Support, Personal Coping Skills, and Family Resources and beliefs held by parents of handicapped children about child development.

Eleven subjects, four fathers and seven mothers completed at least four or more sessions related to stress management training. These participants included two married couples and seven unrelated subjects. These parents were drawn from three separate intervention groups.

As described in previous sections, the stress management intervention involved three major components, social support, cognitive reframing, and relaxation training. On a conceptual level it would be reasonable to predict that each of these strategies would have a general effect on adaptation to stress, as well as an impact on specific components of the T-Double ABCX Model. The following discussion of results will focus on the impact of stress management training on measures related to Pile-Up of stressors (AA factor), Social Support (BBB Factor), Family Resources (BB Factor), Family Appraisal (CC Factor) and Family Coping and Problem-Solving skills (PSC Factor).

Pile-up of stressors. All three of the stress management techniques taught as part of this intervention could be predicted to have an effect on the pile-up of stressors (AA Factor). For example, relaxation training has proven helpful in reducing the physiological, as well as the psychological impact of accumulated stress (Stoyva, & Anderson, 1982). Social support, on the other hand might help to reduce feelings of depression and isolation. However, during the intervention specific child related characteristics such as the acceptability, demandingness, and adaptability of the child were addressed in the context of cognitive reframing. As a result this strategy would be predicted to have the most direct impact on the stress factors measured by the PSI.

Post intervention results of the PSI including differences in mean scores, t-values, and statistical probabilities are presented in Table 16. To summarize these results total stress levels remained relatively constant prior to and following intervention, as did stress related to parent characteristics. Although subtest scores related to child characteristics could logically be assumed to be the most sensitive to this type of intervention, little change relative to these characteristics was noted in this study. A mean difference at a .05 level of significance was observed for only one of the subtests that make up the the Child Characteristics Domain. A significant decrease (p.04) in stress related to the amount of of reinforcement parents obtained from their child was noted following stress management training. This finding suggests that parents participating in this component of the intervention viewed their child as less stressful, and as a greater source of reinforcement.

Mean scores on each of the subtests related to parental characteristics also remained relatively stable. Differences in mean scores taken prior to and following stress management training exceeded the .05 level of significance on only one subtest. The participants reported significantly less stress (p .04) associated with their relationship to their spouse. This finding suggests that parents perceived their spouses to be somewhat more supportive both emotionally, and instrumentally following stress management training.

Social support and family resources. Stress management training was also designed to have a direct impact on social support (BBB Factor). Efforts were made to enhance this form of support incidentaly through participation in a group process, as well as through direct assignment to "buddy up" with another parent in the group. Although a spill-over effect to all sources of support could be predicted, it is more likely that parents would report increased support from extrafamilial sources including: special groups, community groups, and professional service providers. Each

TABLE 16

Comparison of Means Before and After Stress Management Training on the Parenting Stress Index (PSI).

PSI Score	Pre Intervention	Post-Intervention	p
Adaptability	29.6	27.9	.19
Acceptability	18.5	19.2	.29
Demandingness	23.5	23.9	.37
Mood	10.6	9.9	.35
Distractibility	30.5	29.4	.22
Reinforcement	11.8	10.1	.04*
Depression	20.6	29.8	.42
Attachment	14.1	15.0	.15
Restriction	18.5	19.3	.28
Competence	30.5	31.7	.19
Isolation	16.0	15.3	.25
Spouse	19.1	16.5	.04*
Health	13.7	14.0	.39
Child Total	124.5	120.5	.26
Parent Total	132.4	130.8	.37
Total PSI	256.8	252.5	.32

Note. Statistical significance for mean difference was obtained from a 1-tailed t-test.for Dependent Samples.

of these sources is measured by the SSI. Differences in mean scores, paired t-values and probabilities are Table 17.

The post intervention results of the SSI did not provide strong evidence of enhanced social support. Although marginal increases were noted for sources including: spouse/partner, children, community groups, and special groups, none of these differences achieved a .05 level of significance. Predicted increases in social support from special groups approached significance (p=.07). The greatest increase was obtained on a measure of support from church/synagogue which was significant at a .05 level. Surprisingly, a significant decrease (p=.02) in social support was noted for spiritual faith/people who share common beliefs, while decreases in support from coworkers also approached significance (p=.1).

Family resources. With respect to family resources the FIRM provides a measure of four types of resources including: Family Strengths I: Esteem and Communication, Family Strengths II: Mastery and Health, Extended Family Social Support, and Financial Well-Being. Changes in the first three types of resources could be predicted based on the content of the stress management training particularly those sessions dealing with social support and cognitive reframing.

Table 18 presents differences in mean scores for the FIRM along with t-values and statistical probabilities associated with these values. Post intervention comparisons suggest that Family Strengths I: Esteem and Communication, and Financial Well-Being remained virtually unchanged. While not significant, a trend towards increased resources related to Family Strengths II: Mastery and Health was noted (p=.08). In addition, support from extended family members also demonstrated a non-significant decrease (p=.09) which which may support the suggestion of a decrease reliance on social support from informal sources.

Problem-solving and coping skills. The CHIP was used to measure the coping and problem-solving skills of the participants (PSC Factor). The CHIP taps the parents use

TABLE 17

Comparison of Means Before and After Stress Management Training on the Social Support Index (SSI).

SSI Score	Pre Intervention	Post-Intervention	p
Spouse	12.3	12.6	.36
Children	11.3	11.5	.39
Relatives	10.0	9.5	.16
Friends	10.6	10.1	.22
Co-workers	6.7	6.4	.10
Church/Synagogue	6.2	7.3	.03*
Spiritual Beliefs	9.5	8.5	.02*
Community Groups	6.9	7.6	.13
Professional Groups	8.7	8.9	.38
Special Groups	7.5	8.6	.07
TV/Books	7.6	7.7	.45
Total SSI	103.1	104.4	.36

Note. Statistical significance for mean difference was obtained from a 1-tailed t-test.for Dependent Samples

TABLE 18

Comparison of Means Before and After Stress Management Training on the Family Inventory of Resources for Management (FIRM).

FIRM Score	Pre Intervention	Post-Intervention	p
Family Strengths I: Esteem/Communication	34.1	33.5	.40
Family Strengths II: Mastery/Health	35.7	38.4	.08
Extended Family Social Support	8.4	7.5	.09
Financial Well-being	36.5	36.0	.40
FIRM Total	114.6	115.0	.47

Note. Statistical significance for mean difference was obtained from a 1-tailed t-test.for Dependent Samples

of coping strategies such as maintaining self esteem, social support, and an optimistic perspective on the situation, as well as increasing communication with health care professionals and other parents who may be coping with similar stressors (McCubbin, & Thompson, 1987). Post intervention results of the CHIP are reported in Table 19

It would be reasonable to assume that stress management training would enhance these coping strategies, however, the lack of strong evidence of treatment effects noted in reference to the other self-report measures was also evident in the results of the CHIP. Mean scores for each of the coping patterns measured by this instrument remained relatively unchanged. Mean Scores for Coping Pattern II: Support, Esteem, Stability were in fact identical prior to and following intervention. The greatest degree of change was found for Coping Pattern III: Medical Knowledge (p.06). Items associated with this scale measure the participants efforts to cope by gathering additional knowledge, as well as talking to other parents of ill or handicapped children.

Situational appraisals. Cognitive restructuring by definition encourages individuals to adopt alternate perspectives when encountering situations perceived to be stressful (Goldfried, 1988). It would be reasonable to assume that this component of the stress management training would have an impact on parental attitudes and beliefs towards child development. In the present study the CODQ was used to provide some indication of change in these attitudes.

Although 11 of the participants completed the CODQ before stress management training only 9 forms were returned. Small sample size precluded the use of a t-Test. To aide in the discussion of the results the analysis will be limited to description and visual analysis. Box plots are presented in Figure 6, while pre and post-intervention means and standard deviations are described in Table 20. In addition, some indication of the significance of change can be determined by comparing the porportion of subjects increasing or decreasing their scores with the probabilities associated with a Sign Test. A Sign Test is a relatively assumption free statistical procedure that is appropriate for

TABLE 19

Comparison of Means Before and After Stress Management Training on the Coping Health Inventory for Parents (CHIP).

SSI Score	Pre Intervention	Post-Intervention	p
Coping Pattern I: Integration/Optimism/ Cooperation	34.7	36.0	.29
Coping Pattern II: Support/Esteem/ Stability	28.2	28.2	-
Coping Pattern III: Medical Understanding	16.9	18.3	.06

Note. Statistical significance for mean difference was obtained from a 1-tailed t-test.for Dependent Samples

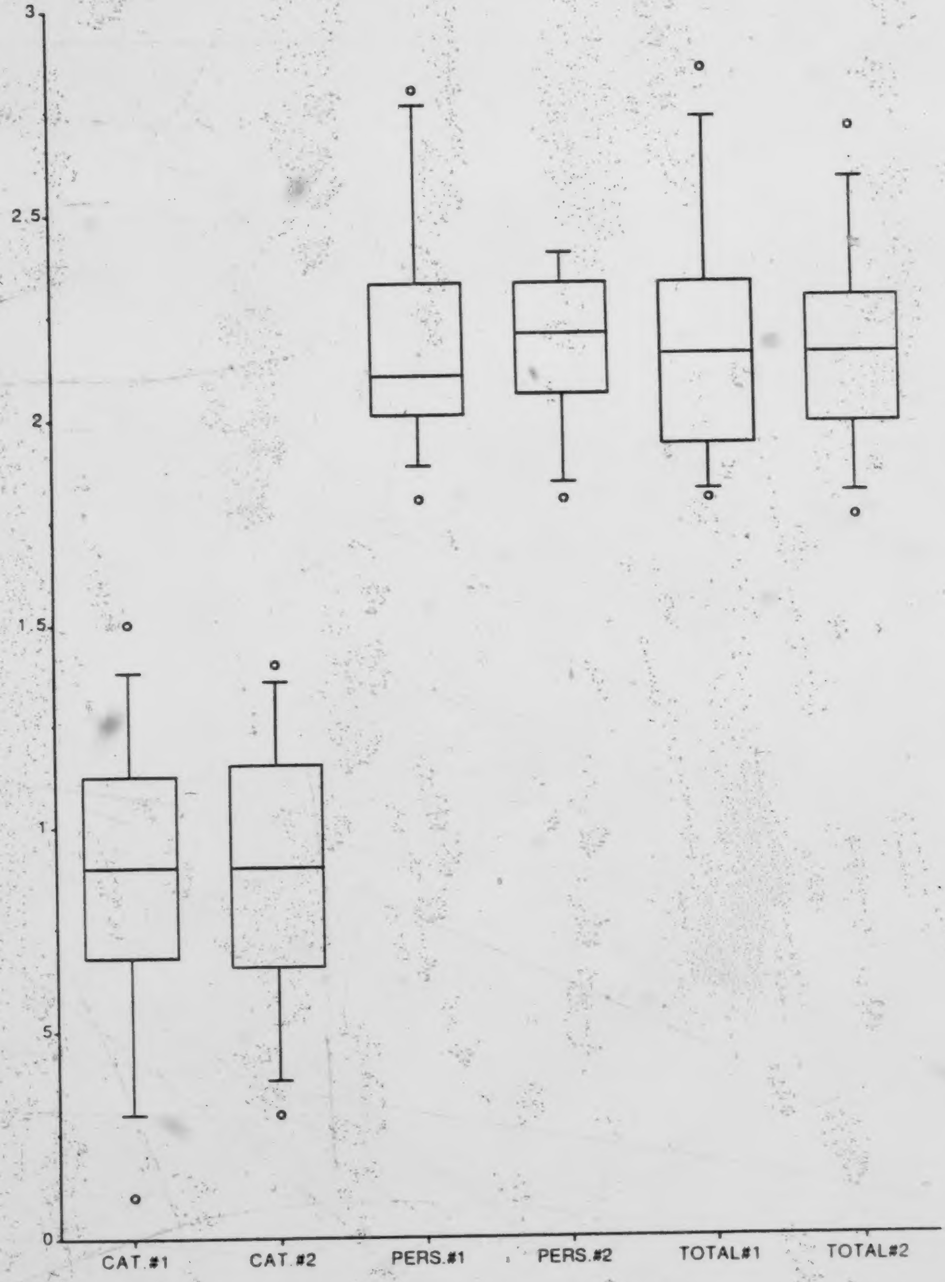
TABLE 20

Comparison of Means Before and After Stress Management Training on the Concepts of Development Questionaire (CODQ).

CODQ Score	Pre Intervention		Post-Intervention	
	Mean	Deviation	Mean	Deviation
Categorical Thinking:	.87	.41	.87	.36
Perspectivistic Thinking:	2.21	.33	2.16	.21
CODQ Total	2.17	.35	2.16	.28

FIGURE 6

CODQ SCORES BEFORE AND AFTER STRESS MANAGEMENT TRAINING



situations where the researcher wishes to compare related observations under two conditions (Dixon & Massey, 1969). This type of test evaluates the direction of the differences between two measures rather than the magnitude of the "average" change. In a sign test probabilities are established for the portion of scores changed in one direction under a one tailed test, or in either direction under a two tailed test (Seigel & Castellan, Jr., 1988). Sample size is determined by the number of observations in which change in direction has occured. Tied pairs of scores are excluded from the analysis, reducing the N size (Seigel & Castellan, 1988). Under a one-tailed test with samples involving nine pairs of observations, only values as low as 0, 1, or 2 would be significant at a .05, or .1 level. In other words, in order to be 90% certain that factors other than chance produced a change in scores, at least seven out of nine pairs of observations would be required to change in a common direction. Change of this magnitude was not observed for the Total Score or either of the subtest scores on the CDOQ. Only two of the subjects increased their total scores on the CODQ, while five subjects demonstrated marginal decreases, and two remained the same.

Given the content of the intervention an increase in scores related to Perspectivistic Thinking could be expected, along with reduced scores for Categorical Thinking. In the present study three subjects increased their scores on Perspectivistic Thinking, while three subjects obtained reduced scores and three subjects received tied scores. Scores associated with categorical thinking increased for four subjects, while three of the subjects obtained the expected decreases.

In summary, the results of a comprehensive battery of self-report measures related to components of the T-Double ABCX Model of family adaptation to stress demonstrated only modest evidence of change following stress management training. In terms of the pile-up of stressors the results suggested that participants found their relationship with their spouses somewhat less stressful. There was also some indication from the data that these parents viewed their child as more reinforcing following intervention.

While total levels of social support remained relatively unchanged, a significant decrease in social support from spiritual faith and persons who share common beliefs was noted. Paradoxically, increases in support from church and synagogue also achieved significance. Support from special groups which could be predicted to be particularly sensitive to this type of intervention increased marginally.

The results of the CHIP indicated a trend towards increased use of coping patterns involving the acquisition of medical knowledge, and sharing of experiences with other parents of ill or handicapped children. In terms of family resources an increase in feelings of health and mastery was noted on the FIRM along with a trend towards decreased reliance on members of the extended family for support. Finally, post intervention scores on the CODQ failed to provide evidence that the participants had altered their beliefs or attitudes towards child development.

Effects of Natural Teaching Strategies

Research Question 7b

> Does instruction in the use of natural teaching strategies have an impact on measures of Pile Ups, Social Support, Personal Coping Skills, and Family Resources and beliefs held by parents of handicapped children about child development.

This section will examine the effect of instruction in the use of natural teaching strategies on the self-report measures described previously. In two of the three treatment groups the natural teaching strategies component was preceded by stress management training. Attrition reduced the numbers of subjects who completed the second component of the intervention from eleven to eight subjects, one of those participants, however, completed the intervention but failed to return all of the self-report measures. These subjects included a single husband and wife pair, four mothers and one father.

Within the model described by McCubbin and Thompson, (1987) two factors, directly related to interactional competency, may be identified. This form of intervention would most likely be effective in reducing the pile-up of stressors related to child characteristics, and in enhancing family resources, particularly feelings of esteem and mastery. In addition, it is reasonable to predict that personal problem-solving and coping skills and parental appraisal of child development would be affected to a lesser extent by training in the use of natural teaching strategies.

Analysis of pre-post intervention data was limited by the size of the sample. The probabilities associated with a binomial distribution will be employed as a benchmark against which the direction of the observed change may be measured. Under this criteria, a one tailed test of significance would require that all pairs of observations in a sample of six, and all but one in a sample of seven cases would have to change in the same direction to be significant at the .05 level (Dixon & Massey, 1969). In addition, pre and post-intervention means and standard deviations for the PSI, SSI, FIRM, CHIP, and CODQ are presented in Appendix F, while box and whisker plots of total scores and selected subtest scores are presented in Appendix G.

Pile up of stressors. Increasing a parent's ability to interact effectively with their child might have an impact on pile-up of stressors (AA Factor). Enhanced competency in this area could conceivably reduce stress related to child characteristics such as the demandingness of the child, the amount of reinforcement parents felt they derived from their child, and parental perception of their child's adaptability to new situations. In addition, effective intervention might result in reduction in stress related to parental characteristics including, feelings of competence and parental attachment.

Five of the seven participants completing the natural teaching strategies component of the intervention obtained lower total PSI scores. Within the Child

Characteristics Domain a similar magnitude of change was observed for only one subtest, Child Distractibility. The change in this instance, however, was towards increased stress associated with these characteristics. In the Parent Characteristics Domain five parents reported a decrease in stress related to feelings of competence.

Problem-solving and coping strategies. The CHIP provides a measure of coping strategies utilized by parents who are attempting to deal with a chronic stressor. The patterns of coping skills described by the various items on the CHIP include: situational appraisal, social support, family integration, and enhanced medical knowledge. Differences in pre and post-intervention administration of the CHIP did not indicate a consistent change in direction. The greatest proportional change on this instrument was obtained on Coping Pattern III: Medical Knowledge. Four out of the seven participants indicated a decrease in the use of this pattern. In general post intervention scores for the CHIP did not indicate a trend towards either an increase or decrease.

Social support and family resources. The Family Inventory of Resources for Management (FIRM) looks at the availability of resources in three areas: a/personal resources, b/family system internal resources, and c/social support (McCubbin, & Thompson, 1987). None of these areas were addressed directly during this component of the intervention, although parental self-esteem and sense of mastery appear to be at least indirectly related to interactive competency.

Of the eight subjects completing the FIRM five parents reported an increase in resources related to Family Strengths I: Esteem and Communication, and Family strengths II; Mastery and Health. In addition five subjects reported a decrease in social support from relatives.

The pattern of responses on the Social Support Inventory (SSI) also failed to show any consistent directional change. The proportion of subjects indicating either a gain or loss of social support did not exceed four out of seven on any given scale. It would be reasonable to predict gains in social support for the scale relateo to special groups as a result of participation in an intervention that provided opportunities to discuss problems with parents in similar circumstances. In the present sample four of the parents reported a gain in support from this source, one parent reported a decrease, while the remaining subjects reported no change.

Situational appraisals. The natural teaching strategies component of the intervention encouraged parents to enter into joint attentional routines with their child, synchronize both the frequency and level of communication, and view undesirable behavior from a functional or communicative perspective. Hence this aspect of the intervention promotes a perspectivistic view of development. The parents responses to the Concepts of Development Questionnaire (CODQ) failed to show any consistent trend towards perspectivistic thinking. Three of the six subjects who completed the CODQ increased their scores on this scale, while two subjects decreased their score. Four of the subjects obtained decreased scores related to Categorical Thinking.

In summary, a comparison of self-report measures administered before and after an intervention designed to encourage parents to use a series of natural teaching strategies failed to reveal any statistically significant findings. The proportion of paired observations demonstrating change in either direction was insufficient to rule out the influence of chance factors.

While it is important to note the lack of statistically significant findings there also appeared to be a number of possible trends in these data. In terms of the pile-up of stressors a number of the parents reported increases in feelings of competence along with a corresponding increase in stress related to the child's distractibility. A comparison of pre and post-intervention means on the PSI (see Appendix F-1) reveal decreases in stress related to both child and parent characteristics following this phase of the project. Reported levels of social support and family resources as measured by the SSI and FIRM increased marginally (Appendix F-2 & F-3).

Effects of Combined Intervention

Research Question 7c

Did continued participation in both interventions result in changes to self-report measures beyond that produced by either individual intervention.

The possibility that continued participation in group intervention over extended periods of time might produce changes in self-report measures unrelated to the effects of specific interventions was explored in the present investigation. Significant changes in post intervention results regardless of the order of intervention would suggest that group participation alone was sufficient bring about change in adaptation to stress. In the present study participants were assessed at three points, prior to and following Intervention 1, and upon completion of Intervention 2. Five of the subjects that completed all phases of the intervention received stress management training prior to the teaching strategies intervention, the order was reversed for the remaining two. To evaluate the effects of continued participation regardless of order of treatment all subjects completing both phases were compared at baseline and upon completion of the second set of sessions. Summary statistics for each of the measures used in this comparison are described in Appendix H, while box and whisker plots of the total scores are presented in Appendix I.

For the sake of brevity this discussion will be limited to those post intervention measures where at least five out of six, or six out of seven of the participants demonstrated a change in a common direction. It is important to note observed values of this magnitude might arise under chance circumstances alone (Dixon & Massey, 1969).

In the present study five out of six subjects obtained lower scores on a measure of stress related to the child as a source of reinforcement. This finding is consistent with the results obtained following stress management training and does not suggest any additional benefits of continued participation. Six out of seven of the participants , however, reported a decrease in stress related to feelings of isolation.

With reference to social support, no consistent directional change was noted in the SSI. In contrast five out of six of the subjects reported a decrease in social support from extended family members on the FIRM. Together these findings indicate that extended participation reduced feelings of isolation without increasing perceptions of support from those sources identified on the SSI, or the FIRM. This outcome raises the possibility that the instruments used were insensitive to the type of support derived from the group, however, given the sample size and the probabilities associated with the observed results these conclusions must remain at the level of conjecture and a possible topic for future research.

Based on the porportions of subjects demonstrating either increased or decreased scores on the CHIP and CODQ there is little evidence of any impact on these self-report measures arising from continued participation in the intervention.

In summary differences between baseline and final assessment are marginal. The strongest evidence for systematic change occured on a measure of isolation. Continued participation did not result in changes beyond what was observed relative to the specific interventions.

Effects of Intervention on Parent-Child Interaction

The final component of the analysis is concerned with the effect of both stress management training and natural teaching strategies on parent-child interaction. Although the original research plan had called for standardization in the materials, setting, and conditions during the videotaped sequences, situational circumstances interfered with strict adherence to these conditions. Problems related to child care and transportation required modifications in the time, and often the setting of the videotaped sequences. For example, members of the assessment team were required to complete some of the videotaping in the participants homes with portable videocameras. As a result sound and picture quality varied substantially. More importantly, differences in setting and materials are known to have an impact on the pattern of interaction between child and parent (Comfort, 1988).

Videotaped interaction sequences for four of the eight participants who completed both phases of the project were selected for coding and analysis. Selection was based primarily on the quality and completeness of the sequences. The four sets of interaction sequences were of sufficient quality to permit analysis of two, two minute semistructured play sessions at each of the assessment points.

Small sample size and lack of standardized conditions limits analysis of group effects. The following discussion of results will focus on changes in interactional patterns for each of the four mother-child dyads, along with a brief description of group effects for pairs of dyads receiving the intervention in the same order. In keeping with the systems approach outlined in the literature review, each of the dyads will be described with reference to important child and parent characteristics. In addition, the results of self-report measures, and qualitative data obtained during interviews, will be used to provide additional information about the parents' perceived level of stress and supports, as well as reactions to the natural teaching strategies component of the intervention. Finally, any conditions that may have had an impact on these interactions will also be described.

Pre and post-intervention mean frequencies for each of the molar communicative behaviors will be described and illustrated in a series of figures. Pre-intervention frequencies will also be compared to results of a study cited in Kysela, Holdgrapher, McCarthy, and Stewart (in press) that investigated the utilization of communication modes by non-handicapped infants and their mothers.

It should be noted, however, that the observed frequency of communicative behaviors is largely dependent not only on the pattern of interaction within the dyad but also on situational factors (Comfort, 1988). Variations in materials and setting are likely to cause fluctuations in the level and frequency of interaction, unrelated to a significant or enduring change in the partner's pattern of communicative behaviors. For example, an active game of ball may provide increased opportunities for a parent to respond in an action mode, without a concurrent decrease in the use of phrases. However, since the development of conversational routines is based, in part, on appropriate modeling and matching of the child's level of communication (McDonald, & Gillette, 1988), the parents total interactional pattern must be taken into consideration. In addition, since as part of the intervention, parents are encouraged to wait for the child to respond, successful intervention might, therefore actually decrease the total number of communicative exchanges, while increasing the length of the sequence. As a result reference will be made to changes in the porportions of each of the communication modes relative to total number of communicative behaviors observed at any given assessment point.

The presentation of results will consist of a description of the post intervention outcomes for each of the dyads followed by a series of figures illustrating changes in the communication modes utilized by mother and child over the course of the study, as well as changes in the parental use of teaching strategies. The descriptive analysis will be guided by the following research questions. These questions will be refered to again in the summary that follows the individual analysis.

Research Question 8a

Was there a significant change in communication mode utilized by parents following participation in the the natural teaching strategies component of the intervention, stress management training, or both?

Research Question 8b

Was there a significant change in communication mode utilized by the child following parental participation in the natural teaching strategies component of the intervention, stress management training, or both?

Research Question 8c

Was there a significant change in the ratio of mode-matched to nonmode-matched interactions following parental participation in the natural teaching strategies component of the intervention, stress management training, or both?

Research Question 8d

Was there a significant change in the mean length of turn following parental participation in the natural teaching strategies component of the intervention, stress management training, or both?

Research Question 8e

Was there a significant change in parental use of natural teaching strategies associated with either phase of the intervention?

Dyad A

Description of Dyad A

Child A was a male infant with Down Syndrome enrolled in a combined center and home based intervention program. He was 37 months old at the time of the first assessment. According to the Bayley Scales of Infant Development his mental age was 23 months, with a motor age of 18 months. A Vineland Adaptive Behavior Scale, completed immediately following the natural teaching strategies component of the intervention, indicated standard scores (mean=100, standard deviation of 15) of 74 in the Communication Domain, 65 in the Daily Living Skills domain, 68 in the Socialization Domain and 54 in motor skills. These assessments indicated that at the time of the intervention, child A was exhibiting mild to moderate delays across all developmental domains.

Child A's mother was a 37 year old, university educated professional woman. Both parents were present in the home. Child A's father did not participate in the intervention. At the time of the study Mother A was employed, partime, in the rehabilitation field. Interview data indicated that Mother A had some familiarity with the material related to developing conversational routines.

With reference to self-report measures Mother A reported fairly low level of stress. While her total score on the PSI was only 208 (versus a mean of 221 for the normative sample), two scales , Child Acceptability and Feelings of Competence, were elevated above the 90th percentile.

This parent also appeared to enjoy a moderate to high level of parental resources and social support. A total SSI score of 114, was above the mean reported for the normative sample, but well below the maximum of 160 (McCubbin, & Thompson, 1987). In addition, interview data suggested a diverse network of support including spouse, friends, the child's program, as well as support and community groups. Mother A reported that she received instrumental, as well as social support from members of her extended family. A total resource score on the FIRM of 149, was more than two standard deviations above that reported for the normative data. Finally a total score of 2.8 on the CODQ, which ranges from 0 to 3.0, suggests a strong orientation towards perspectivistic thinking.

Mother A attended five out of the six intervention sessions. All interaction sequences were recorded in a laboratory setting at the university, there was, however, variation in the play materials used.

Description of Baseline Observations for Dyad A

During the initial assessment session Mother A used a mean of 16.5, actions, 2 vocalizations, 4.5 single words, and 19 phrases. With the exception of phrases, these frequencies are generally quite similar to those obtained for the mothers of non-handicapped children (Kysela, et al., in press). Mean use of phrases for the nonhandicapped parents was 26.5 with a standard deviation of 9. Mother A therefore used somewhat fewer phrases than the normative sample, although phrases were present in a large porportion of her exchanges with her child (.62).

Child A used a mean of 29.5 actions, 9.5 vocalizations, one word and no phrases. While this child was functioning at a predominantly action/gestural mode, he appeared to be progressing towards a vocalization/single word level.

Three measures of interactive balance and communicative match were calculated for each of the dyads. These included the ratio of parent to child responses, the percentage of mode-matched exchanges, and the mean length of turn sequence. The results of these measures are summarized in Table 21. Data collected at baseline suggest that interaction sequences involving dyad A were balanced in terms of frequency, and were of considerable length. A mismatch in modes, however, was clearly apparent.

Changes in Utilization of Communication Modes for Dyad A

Figure 7 depicts changes in the proportions and frequencies of Mother A's utilization of each of the communication modes. This parent increased her use of words, while sharply decreasing her use of phrases following phase I (natural teaching strategies). Contrary to what would be predicted based on the content of the intervention, the greatest increase in the vocalizations and word use occured after stress management training.

Differences in proportional use of the communication modes were somewhat more consistent with the predicted changes. Increases in actions, and vocalizations, along with a gradual decrease in the use of phrases were all associated with phase I. A trend towards a leveling off, or marginal reversal is evident in the proportional data completed following stress management training.

The predicted impact of intervention on child A's utilization of communication modes would include an increase in the frequency of vocalization and words. Figure 8 depicts the observed changes in frequency of communication modes for child A. Word use appears to have increased gradually throughout the study. An increase in the use of vocalization was associated with stress management training rather than the natural

TABLE 21

Measures of Interactive Balance and Match for Dyad A

Measure	Baseline	Post-Teaching	Post-Stress
% mode matched exchanges	33.9	55.4	57.2
Ratio: child/adult exchanges	1.01	.847	.984
Mean length of turn	13.5	9.9	17.3

FIGURE 7

CHANGE IN MODE UTILIZED BY MOTHER A

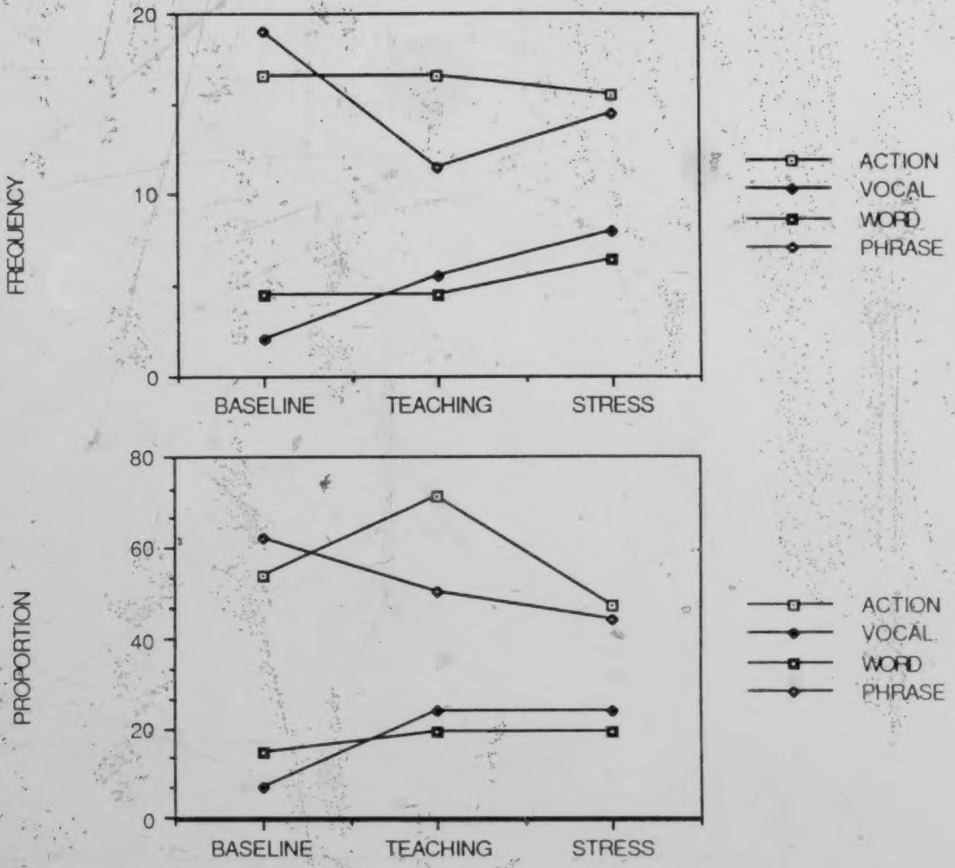
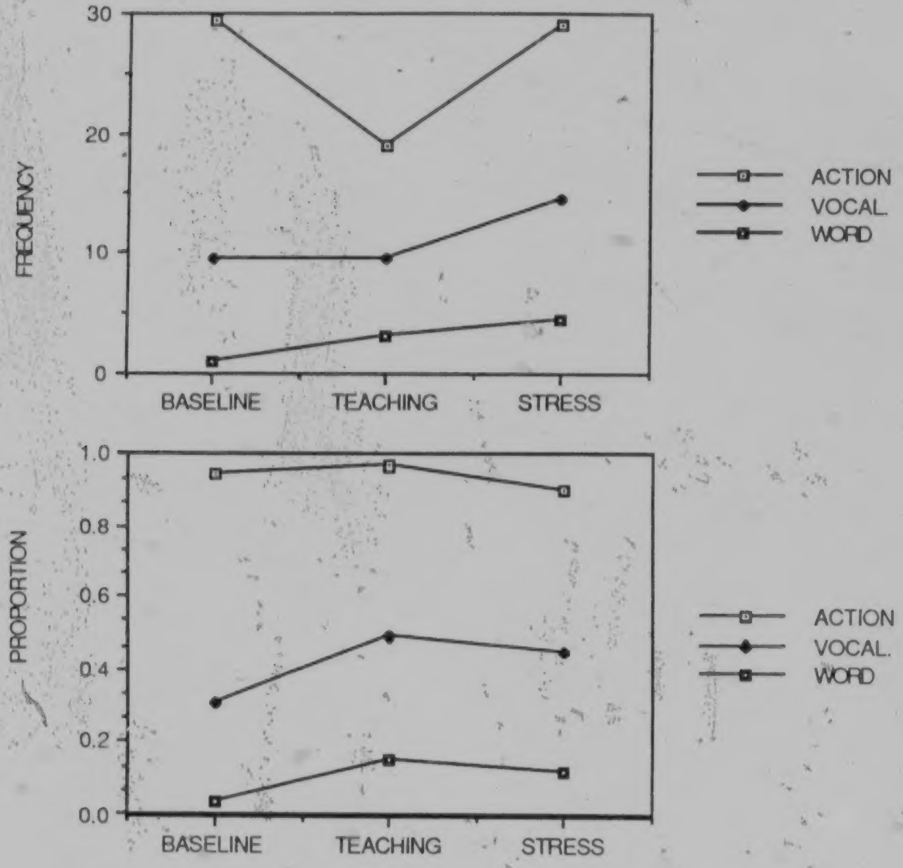


FIGURE 8

CHANGE IN MODE UTILIZED BY CHILD A



teaching component of the intervention. This child's use of vocalization declined markedly following phase I (natural teaching strategies), while returning to near baseline levels at the end of the study.

As in the case of mother A many of these fluctuations can be accounted for by differences in the numbers of exchanges observed at each of the data points. In contrast to the frequency data, proportions of actions remained virtually unchanged prior to and following each of the interventions. In addition, figure 8 suggests a proportional increase in vocalizations and words associated with his mothers completion of the teaching strategies component (phase I), followed by a slight decline or leveling off when the child was assessed at the end of the study.

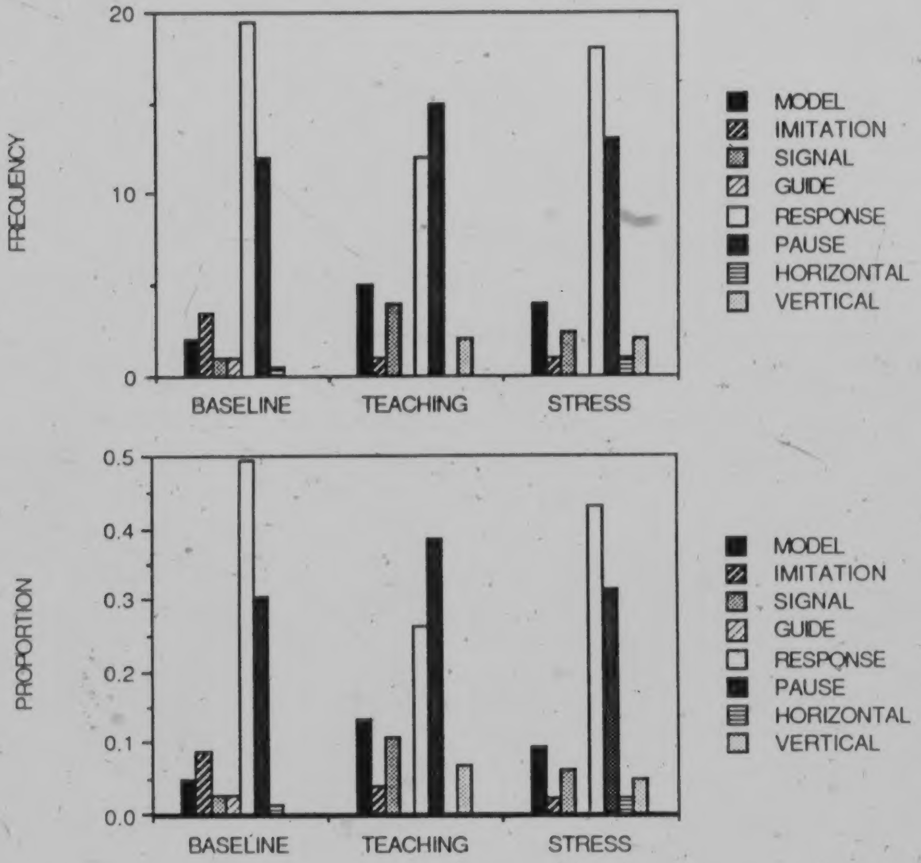
With reference to the degree of balance between child A and his mother (see Table 21), an appreciable increase is evident in the percentage of mode-matched to non matched exchanges following phase I (natural teaching strategies). The ratio of child exchanges and mean length of turn sequence actually decreased following the natural teaching phase of the intervention, mean length of turns, however, increased to beyond baseline levels at the end of the study.

Changes in the use of Teaching Strategies for Dyad A

Changes in mother A's use of the natural teaching strategies are depicted in Figure 9. Between baseline and Phase I increases were noted in the frequency of models, signals, and vertical expansions. During this phase of the study, a sharp decline is also evident in both the proportion and frequency of undifferentiated responses. Surprisingly, this mothers use of imitation also decreased, along with a slight decline in the use of horizontal expansions. Interaction sequences recorded after mother A completed the stress management training indicated a decline in the proportional use models, imitations, signals and vertical expansions. Use of pauses remained constant throughout the study suggesting no change in the use of a "wait" strategy.

FIGURE 9

CHANGE IN TEACHING STRATEGIES UTILIZED BY MOTHER A



Summary of Post-Intervention Results for Dyad A

In summary the mother in this dyad demonstrated a number of changes in her use of communication modes and teaching strategies which were consistent with the content of the interactional component of the intervention. This pattern is particularly evident in the changes in proportions of exchanges involving each of the communication modes and teaching strategies. Increases in utilization of actions and vocalizations along with a decrease in the observed use of phrases were associated with phase I (natural teaching strategies component). In addition increases in the proportional use of teaching strategies including pauses, signals, models, vertical expansions, and a decline in undifferentiated responses were also observed following this mothers involvement with this component of the intervention. As would be predicted, given the nature of the interventions these trends declined or leveled off following stress management training. Finally the interaction between mother and child was substantially more balanced, in terms of communication mode, at the end of phase I.

Dyad B

Description of Dyad B

Child B, a 43 month old male, was also enrolled in a center and home based early intervention program. Although the Bayley Scales of Infant Development was completed on this child, his developmental level exceeded the upper limits of the test. As a result, a mental age could not be established with this instrument. However, on the Vineland Adaptive Behavior Scale completed at the midpoint of the study this child obtained standard scores of 74 in the Communication Domain, 90 in the Daily living Skills Domain, 76 in the Social Skills Domain, and 75 in the Motor Skills Domain. These scores indicate a discrepancy between the functional life skills that this child demonstrated and his skill levels in the other developmental domains, particularly communication.

Mother B was 40 years old at the time of assessment. She had achieved a college education but was not employed outside of the home. Her husband had been involved in the intervention initially, but found it necessary to withdraw for work related reasons. This mother did not indicate that she had any prior knowledge of the specific intervention techniques. During the initial interview, mother B reported that she spent approximately one hour a day in "intensive" play, and felt quite confident with her teaching abilities.

This mother's total score on the PSI was 233, suggesting stress levels well within the normative range (Abidin,1986). Mother B obtained subtest scores above the 90th percentile on two scales related to child characteristics, Child Adaptability, and Child Reinforces Parent. Total scores on the SSI were very similar to those reported by McCubbin and Thompson(1987) for parents of chronically/seriously ill children. Despite moderate income levels this family reported a very high level of family resources, total scores on the FIRM exceeded one standard above the mean of the normative data. With reference to beliefs about child development, a total score of 2.1 on the CODQ represents a moderate level of perspectivistic thinking

The order of intervention for mother B was the teaching strategies component first, followed by stress management training. Mother B attended all intervention sessions. Two of the interaction sequences were videotaped in the university laboratory while the final set of sequences were recorded in the home. Substitution of materials occured in only one of the six sequences analyzed for this study.

Description of Baseline Observations for Dyad B

Data collected at baseline indicated that this mother used a mean of 19 actions, no vocalizations or words, and 28.5 phrases. Comparisons to the normative data are somewhat limited due to the discrepancy in ages between child A and the normative sample (43 months, versus 18 months for the normative group). Nonetheless it is apparent that phrases dominated this mother's interactions with her child..

Child B used a mean of 24 actions, 10.5 vocalizations, 1.8 words, and 1 phrase. It should be noted that some of this child's vocalizations were likely poorly articulated phrases. It was decided, however, that the coding of words or phrases would be limited to only those communicative behaviors that were clearly understandable to a naive observer. In general child B appeared to be at the vocalization/single word level of communicative functioning.

Table 22 gives the results of measures of communicative match and interactive balance throughout the study. A mean length of turn sequence at baseline of 6.1 may be somewhat unrepresentative. During the initial videotaping sessions mother A interrupted the interaction to direct comments at the observer. Generally, however, these results indicate a marked imbalance in the communicative modes utilized.

Changes in Utilization of Communication Modes for Dyad B

Changes in the frequency and proportional use of communication modes for mother B, following each phase of the intervention are depicted in Figure 10. Generally these changes were slight. A marginal increase in the use of actions, vocalizations and words is apparent following phase I (natural teaching strategies). Changes associated with phase II include a slight decrease in the use of vocalizations. Although a marginal increase is apparent in the frequency of use of actions and phrases, inspection of the proportional data (see Figure 10) suggests that the use of these communication modes remained relatively stable throughout the study.

In contrast, changes in child B's use of communication modes are much more apparent (Figure 11). Steady increases in the frequency and proportional use of words and phrases were associated with both phases of the study. Child B's use of vocalizations

TABLE 22

Measures of Interactive Balance and Match for Dyad B

Measure	Baseline	Post-Teaching	Post-Stress
% mode matched exchanges	13.0	31.0	45.0
Ratio: child/adult exchange	.890	.820	.740
Mean length of turn	6.10	12.4	8.00

FIGURE 10

CHANGE IN MODE UTILIZED BY MOTHER B

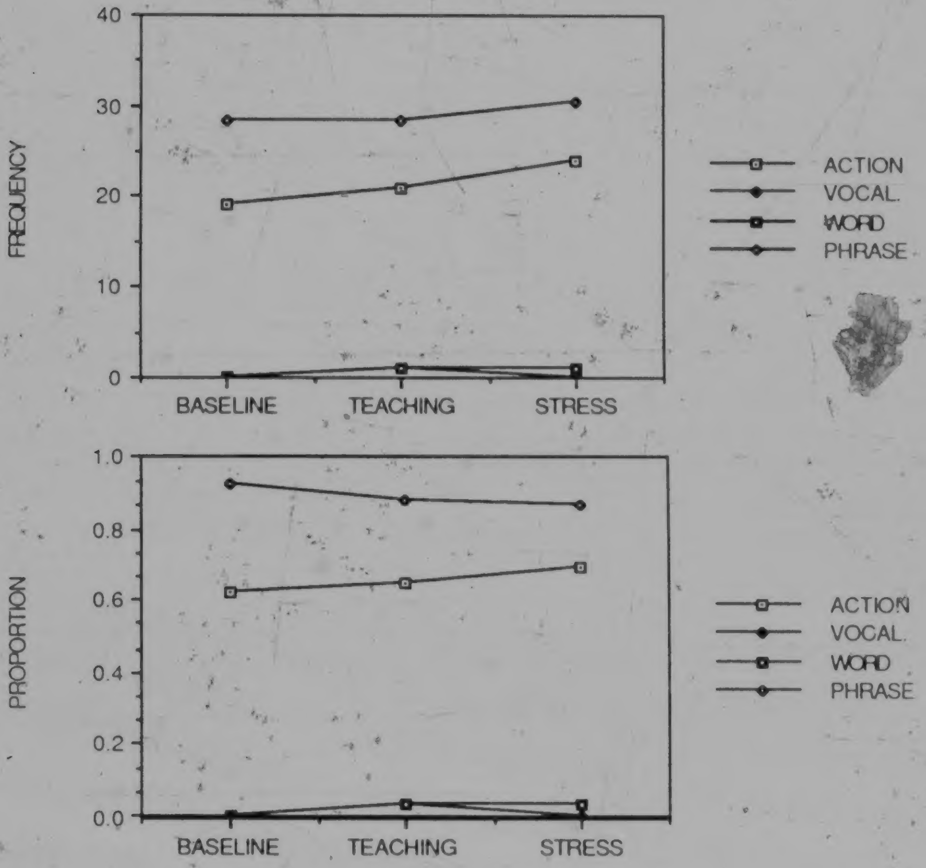
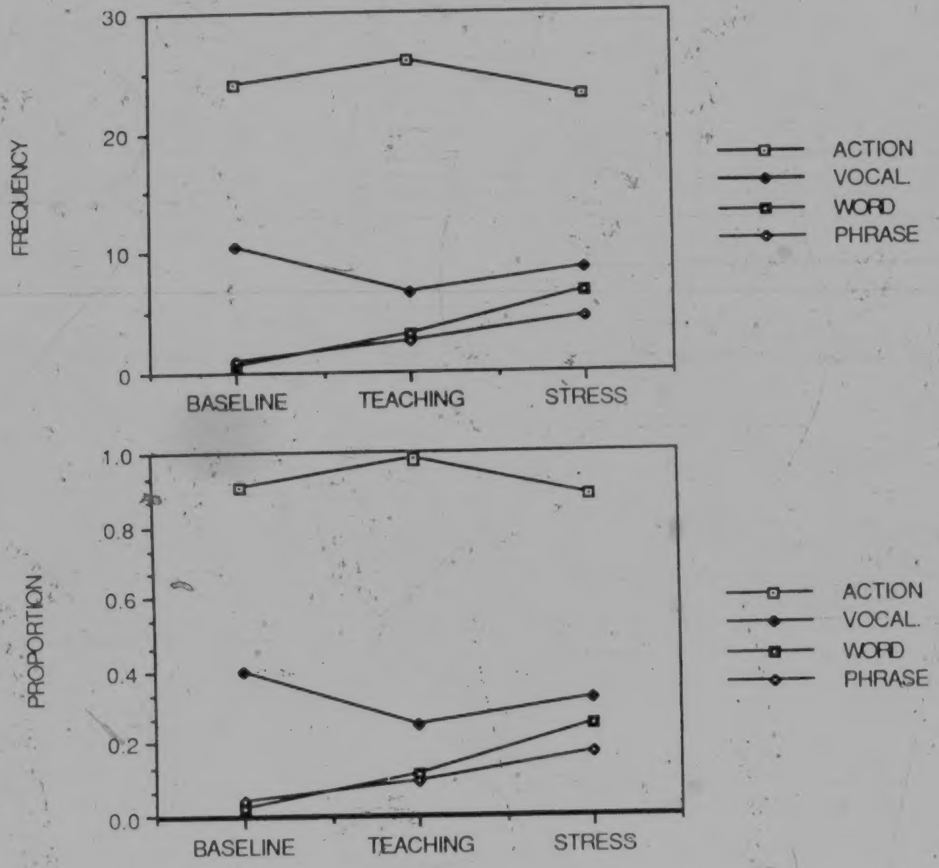


FIGURE 11

CHANGE IN MODE UTILIZED BY CHILD B



declined following his mothers involvement with the teaching strategies component but increased to near baseline levels at the end of the study.

Given child B's increased utilization of the words and phrases, the improvements in this dyad's interactive match evident in Table 22 are not surprising. Increases in the mean length of turn were noted throughout the study but were particularly evident following the natural teaching strategies component.

Changes in the use of Teaching Strategies for Dyad B

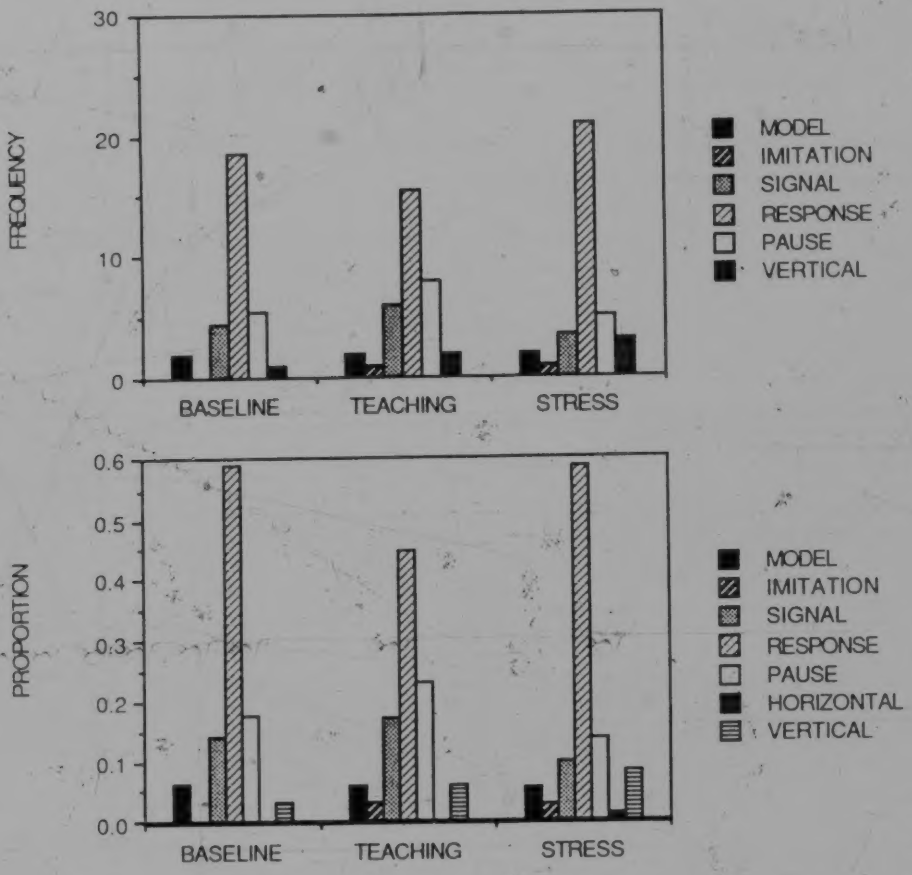
Figure 12 illustrates the changes in mother B's use of specific teaching strategies at each phase of the study. Increases in the utilization of pauses, signals, imitations and vertical expansions along with a decrease in undifferentiated responses were associated with phase I of the intervention (natural teaching strategies). A return to near baseline levels occured for pauses, signals and undifferentiated responses following stress management training. Marginal increases are apparent in the use of both forms of expansions at the end of the study.

Summary of Post Intervention Results for Dyad B

In summary improvements in the partners communicative match were evident throughout both phases of the study. These improvements appear to be largely due to increased use of the higher communication modes by child B. Increased length of turn sequence following phase I (teaching strategies) appears to be associated with an increase in maternal use of pauses and a decrease in the use of undifferentiated responses. In contrast, data collected on communication modes suggests little modification in the complexity of the language used by this mother.

FIGURE 12

CHANGE IN TEACHING STRATEGIES UTILIZED BY MOTHER B



Dyad C

Description of Dyad C

Child C was a 32 month old female with Down Syndrome. At the time of the assessment she was involved in a home based intervention program. The family received visits from an intervention worker approximately once a month. This child's developmental level exceeded the limits of the Bayley Scales of Infant Development. Child C's score on the Vineland Adaptive Behavior Scale indicated a moderate degree of developmental delay. She obtained a standard score of 72 in the Communication Domain, 84 in the Daily Living Skills Domain, 65 in the Socialization Domain, and 64 in the Motor Skills Domain.

Mother C was 45 years old at the time of the first assessment. She reported that she had graduated from university, and identified her occupation as that of a homemaker. This mother indicated that she spent approximately one hour a week in direct teaching activities with her child. Although mother C reported that she had some prior knowledge of the teaching strategies, she indicated that the intervention consolidated her skills, stating that it "helped me to understand it better. See the reason behind it". The child's father did not participate in the intervention.

Mother C's total stress score on the PSI was relatively low, however, she obtained high scores on a number of the specific subtests. Her score on the Child Characteristics Domain of the PSI was one standard deviation above the mean reported for the standardization sample (i.e.126, compared 98 for the normative group). In addition, mother C obtained scores in the 90th percentile or greater on measures of child adaptability and acceptability. This mother identified a number of sources of social support in the initial interview including her spouse, friends, the child's program, informal contacts with other mothers of Down Syndrome and a parent support group. Mother C's score on the FIRM was somewhat lower than that reported for parents of seriously/chronically ill children (i.e. 98, versus 110). Specifically resources related to feelings of mastery and health, as well as support from extended family members were one standard deviation or more below the normative group.

With reference to concepts of development, mother C obtained a total score of 2.0 on the CODQ. Her pattern of scores on this instrument was somewhat unusual. Mother C obtained relatively high scores on both Perspectivistic thinking (2.3), as well as Categorical thinking (1.3). This relatively high score on Categorical thinking appeared to be related to affirmative answers to items reflecting a traditional view of sex roles, such as "fathers cannot raise their children as well as mothers", rather than rigid views on child development.

Mother C missed two sessions. Her responses during the follow up interview indicated that she had attended those sessions where the techniques specifically concerned with building conversational routines were discussed and demonstrated. Videotaping for this dyad was completed at the University of Alberta. The laboratory designed for that purpose was used for the taping of the second and third sessions. Videotaping of the first session took place in a classroom within the Education building at the University of Alberta. The same stimulus materials were used for each session.

Description of Baseline observations for Dyad C

At the start of the study Mother C used a mean of 24 actions, 3.5 vocalizations, 8 words and 24 phrases during a two minute sequence. In the normative data cited in (Kysela, et al., in press) the parents of non-handicapped children were reported to use a mean of 16.3 actions, .58, vocalizations, 5.27 words and 26.5 phrases (standard deviations were reported for vocalizations and phrases only). Hence this mother used slightly more actions, vocalizations, and words than the comparison group.

Child C used a mean of 32 actions, 7 vocalizations, 3.5 words and no phrases at baseline. These data suggest that although this child was clearly in the transition from preverbal communication to speech, actions dominated her exchanges. This appears to be evident in measures of conversational balance and match (see Table 23). Despite Mother C's relatively high use of the less complex communication modes the percentage of mod-matched exchanges was quite low.

Changes in Utilization of Communication Modes for Dyad C

The pattern of change in mother C's utilization of the communication modes is generally the same for both proportional, and frequency data (see Figure 13). While the changes associated with phase II (natural teaching strategies) were modest, they were in the predicted direction. An increase, or slight acceleration in an existing upwards trend, is apparent in this mothers' utilization of vocalizations, single words and actions. Observed use of phrases declined at a similar rate for both phases of the study.

With reference to child C's use of each of the communication modes Figure 14 depicts changes in proportion and frequency throughout the study. The most noteworthy post intervention changes occured in this child's use of actions and vocalizations. A sharp decline is evident in child C's use of actions, while her vocalizations increased markedly between baseline and her mothers completion of stress management training. Slight increases associated with phase II (natural teaching strategies) were evident for both these modes. Finally, this child was observed to use phrases at the end of the study.

As the data in Table 23 suggests, increases were evident in measures of exchange balance and interactive match. While the percentage of mode-matched exchanges and mean length of turn increased throughout the study, only the change in mean length of turn was strongly associated with the natural teaching strategies component rather than with stress management training.

Changes in the use of Teaching Strategies for Dyad C

A number of changes consistent with training in the use of natural teaching strategies is evident in this parents interactions with her child (see Figure 15).

TABLE 23

Measures of Interactive Balance and Match for Dyad C

Measure	Baseline	Post-Stress	Post-Teaching
% mode matched exchanges	25.6	49.0	62.0
Ratio: child/adult exchange	.792	.86	.86
Mean length of turn	8.6	5.25	13.4

FIGURE 13

CHANGE IN MODE UTILIZED BY MOTHER C

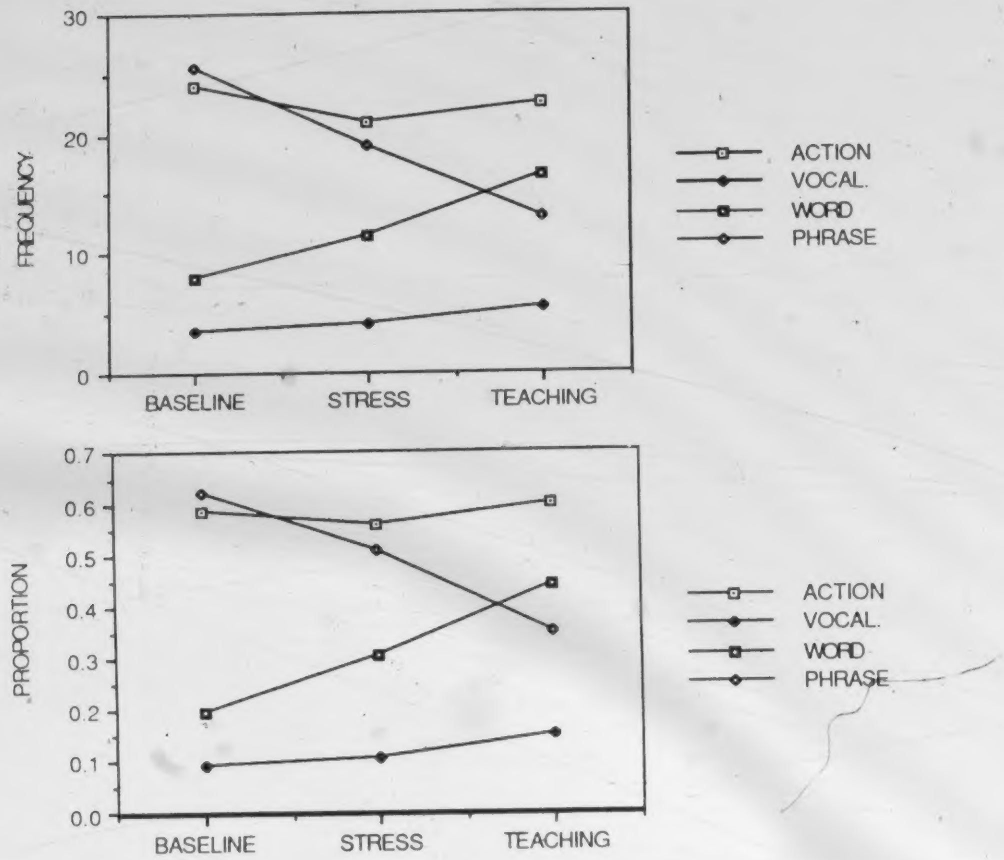


FIGURE 14

CHANGE IN MODE UTILIZED BY CHILD C

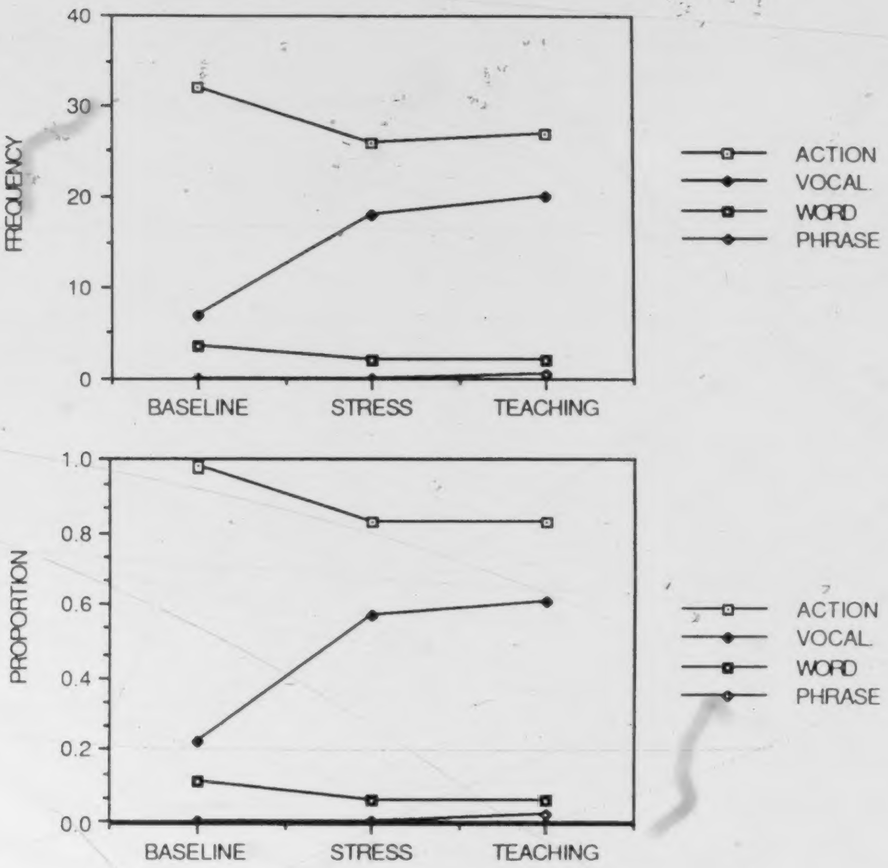
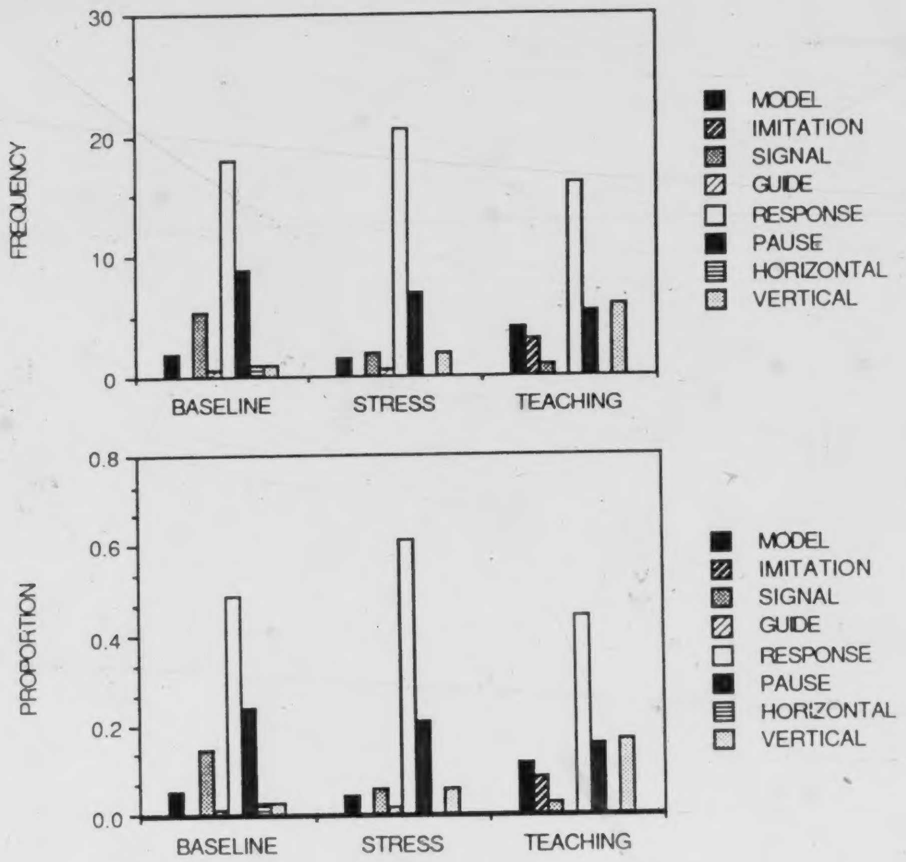


FIGURE 15

CHANGE IN TEACHING STRATEGIES UTILIZED BY MOTHER C



Decreases in Mother C's use of undifferentiated responses along with an increase in models, imitations and vertical expansions are apparent in the sequences recorded after she completed the teaching strategies phase of the intervention. A gradual decline in this mothers use of pauses and signals is also apparent following each intervention. While a decrease in these behaviors might seem undesirable, it is possible that these declines are associated with fewer unsuccessful exchanges.

Summary of Post Intervention Results for Dyad C

To summarize the changes in interaction for this dyad, mother C demonstrated modest gains in the desired direction on measures of communication mode and teaching strategies. Changes apparent in data completed following phase II (natural teaching strategies) were most apparent in this mother's use of specific teaching techniques. Changes in her utilization of communication modes following phase II consisted of acceleration of existing trends. Child C also demonstrated an increase in vocal and verbal forms of communication throughout the study, however these trends did not appear to be associated with phase II. Generally a greater interactive match was achieved, accompanied by longer turns. As was the case with dyad B; improvement in the communicative match apparent in this dyad appears to be partly a function of the development of the child's communication skills. In contrast to mother B, however, mother C demonstrates evidence of modifying her communicative behavior to match that of the child.

Dyad D

Description of Dyad D

Child D was a 53 month old boy involved in a school and home based intervention program. On the Vineland Adaptive Behavior Scale this child received a standard score of 72 in the Communication Domain, 63 in the Daily Living Skills Domain, 56 in the Social

Skills Domain, and 61 in the Motor Skills Domain. The results of a short form of the Stanford-Binet Intelligence Scale: Fourth Edition indicated a composite score of 92. Together these instruments indicate a significant discrepancy between this child's' communicative and social functioning, and his cognitive abilities.

Mother D was 33 years old with a high school education. At the time of the assessment she was employed part time as a retail sales worker in a department store. Father D, a truck driver, did not participate in the intervention. During the initial interview mother D stated that her husband did not feel he was under any stress. Child D is the youngest of three children.

Mother D reported that she spent approximately two and one half hours a week in direct teaching activities with her son. She rated her teaching skills as "improving" and did not identify any specific teaching techniques. She identified her primary concern regarding her child's development as his poor communication skills.

The pattern of mother D 's responses to the self-report measures and the initial interview suggested that this mother experienced a relatively low level of stress, while possessing adequate resources to cope with the demands of parenting a handicapped child. A total PSI score of 217 was slightly below the normative mean. Mother D obtained a high score on only one subtest, a measure of stress related to child acceptability. With a total support score on the SSI of 112 perceived levels of social support were also moderately high. Mother D identified friends, a local support group for parents of autistic children, and members of the extended family as important sources of support. This mothers' total parenting resource score on the FIRM was more than two standard deviations above the mean reported for the parents of chronically/seriously ill children.

Mother D obtained score of 1.2 on the Categorical thinking scale of the CODQ, along with a score of 2.1 on the Perspectivistic scale. Agreement with items such as "Parents must keep their standards and rules no matter what their child is like" and "A child who isn't toilet trained by three years of age must have something wrong with him" suggest relatively inflexible views towards development.

Description of Baseline Observations for Dyad D

During the two minute interaction sequences videotaped at baseline Mother D used a mean of 15.5 actions, 2 vocalizations, 3 single words and 35 phrases. The most noteworthy difference between these data, and that reported for nonhandicapped dyads (Kysela, et al., in press), was this mothers high use of phrases (i.e. 35, compared to 26.5 for the normative sample). It should be cautioned, however, that the children in the comparison group were significantly younger than child D.

During baseline this child was observed to use a mean of 19 actions, 13.5 vocalizations, 2 words and no phrases. Again articulation problems made the reliable coding of phrases difficult. Table 24 indicates a very low percentage of mode-matched exchanges at baseline.

Changes in Utilization of Communication Modes for Dyad D

Change in mother D's use of the communication modes is most apparent in the proportional data displayed in Figure 16. Changes associated with the natural teaching strategies training sessions (phase II) include slight decreases in the utilization of phrases, actions, and vocalizations, accompanied by an increase in the use of single words. The striking increase in the frequency and proportion of actions apparent between baseline and phase I (stress management training) may be attributable to a change in the stimulus materials used during the videotaping sessions. A ball was used during sessions 2 and 3 only, resulting in an increase in action based exchanges.

With reference to child D's use of communication modes Figure 17 indicates a slight increase in the frequency of this child's use of phrases following stress

TABLE 24

Measures of Interactive Balance and Match for Dyad D

Measure	Baseline	Post-Stress	Post-Teaching
% mode matched exchanges	13.0	14.4	30.6
Ratio: child/adult exchange	.65	.75	.773
Mean length of turn	6.0	4.2	6.0

FIGURE 16

CHANGE IN MODE UTILIZED BY MOTHER D

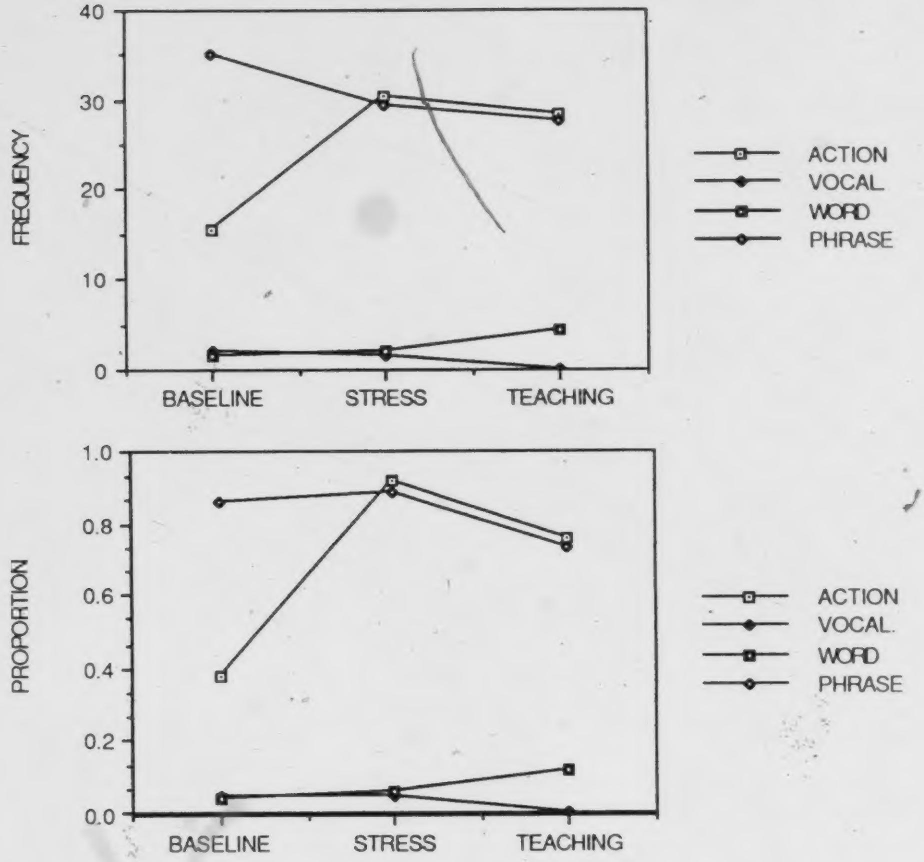
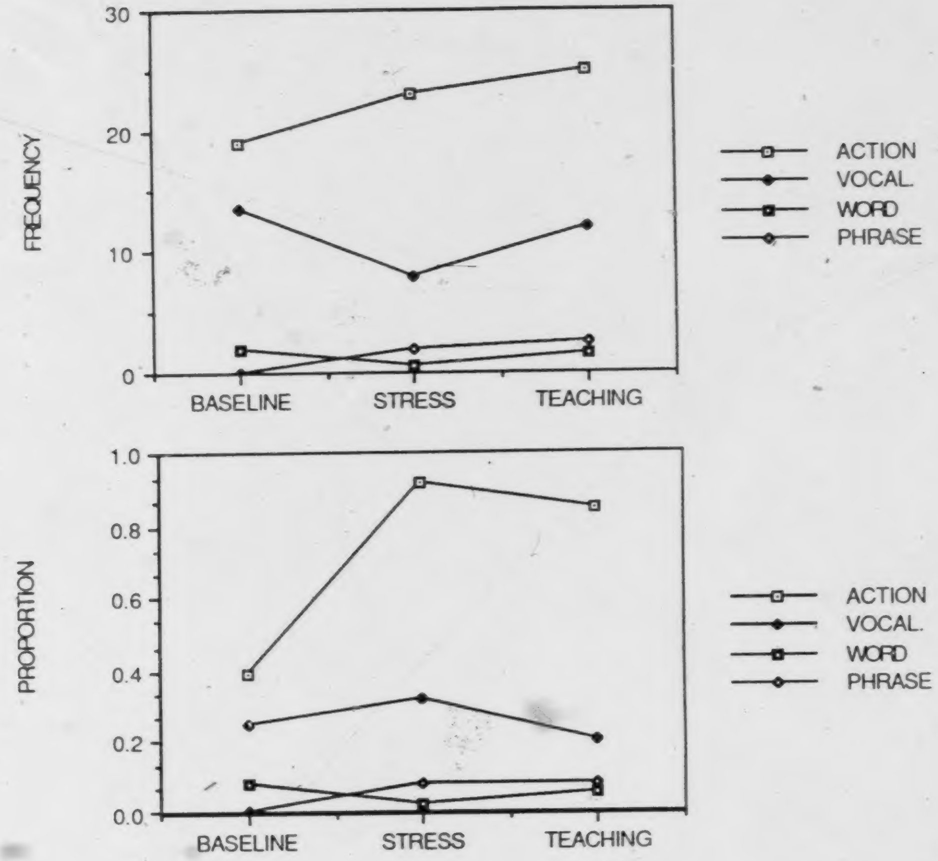


FIGURE 17

CHANGE IN MODE UTILIZED BY CHILD D



management training. Proportional data did indicate a decline in the child's use of vocalization following phase II of the intervention. However, the proportion of exchanges involving vocalization observed after the natural teaching strategies was not substantially different than that observed at baseline.

The match between the partners use of communication modes increased as the study progressed. An increase in the percentage of mode- matched exchanges was particularly evident following this mothers completion of the teaching strategies component of the intervention. An increase in the mean length of turn over baseline levels was not observed at any point in the study.

Changes in the Use of Teaching Strategies for Dyad D

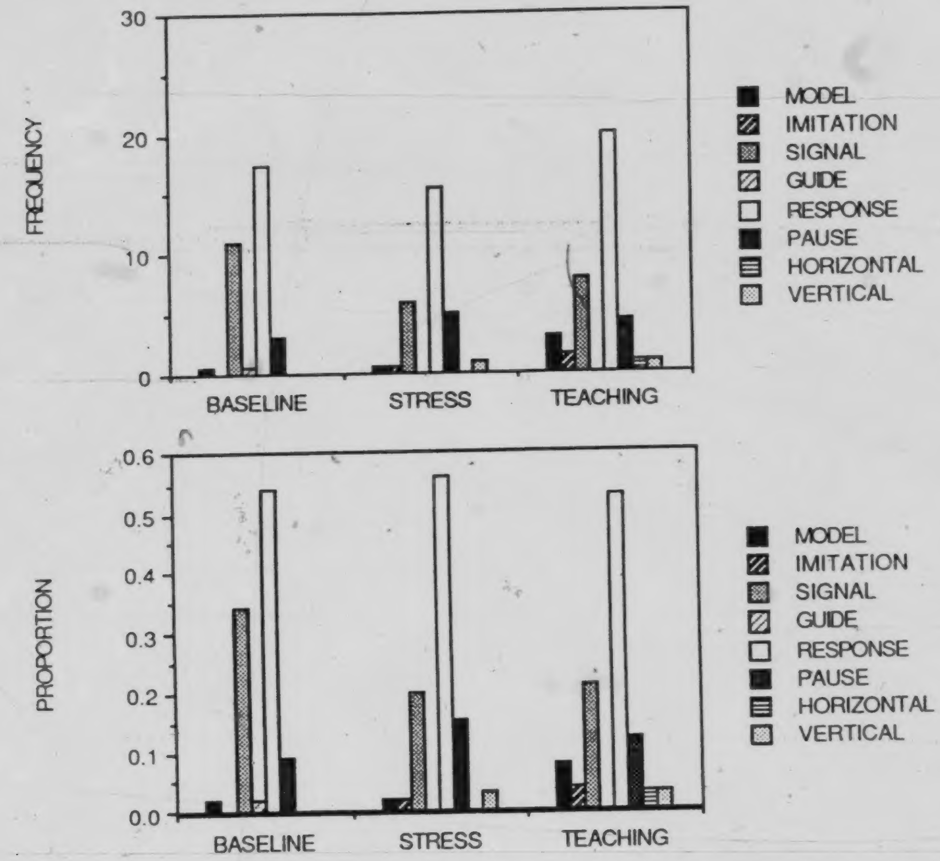
Changes in mother D's use of specific teaching techniques are depicted in Figure 18. As suggested by this graph her use of models, imitations and horizontal expansions increased only marginally, following training in the use of these teaching strategies. A greater degree of change is apparent between baseline and stress management training. Pauses and vertical expansions increased while this parents use of signals declined markedly.

Summary of Post Intervention Results for Dyad D

To summarize, slight declines in this mother's use of phrases, actions and vocalizations, along with an equally modest increase in use of single words appeared to be associated with her involvement in the natural teaching strategies phase of the intervention. She did not appear, however, to incorporate the teaching techniques taught during the intervention into her interactions with her child. Increases in the percentage of mode-matched turns appears to be due to more frequent use of phrases by child D, as well as some modification in the complexity of the language used by this mother.

FIGURE 18

CHANGE IN TEACHING STATEGIES UTILIZED BY MOTHER D



Summary of Intervention Effects on Parent-Child Interaction

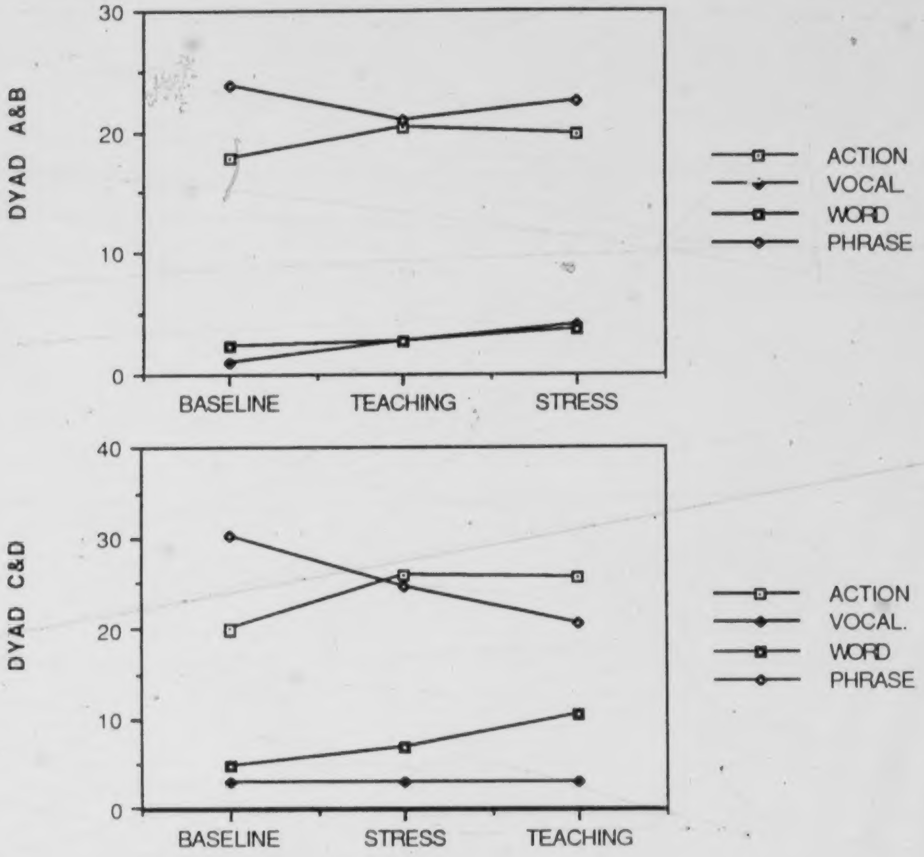
The results of the self-report measures and descriptive data suggest that as a group these four mothers were mature in terms of age, possessed fairly high levels of family resources, and were generally well educated. None of these mothers demonstrated excessively high levels of generalized stress. All, however, obtained scores at or above the 90th percentile on at least one of the measures related to child characteristics. Only mother A obtained a high score on measures of stress associated with parent characteristics, specifically, feelings of competence. All four mothers reported high levels social support from a variety of sources including their spouses, children, friends, relatives, and outside agencies.

The four children selected for this component of the analysis demonstrated mild to moderate delays across several important developmental domains, including communication and socialization. Two of these children had Down Syndrome, while the remaining two children appeared to have severe language difficulties including problems related to articulation. The children with Down Syndrome were considerably younger than the other two children (32 months, and 37 months, versus 47 and 53 months).

With reference to Research Question 8a, modification of communication mode, Figure 19 illustrates changes in the mean frequencies for pairs of dyads that received the interventions in the same order. Mothers A and B received the teaching strategies component first followed by stress management training. Increases in the use of actions, accompanied by a decrease in the use of phrases are evident in the data collected shortly after the completion of phase I (natural teaching strategies). For dyads C and D increases in the use of actions are associated with stress management training. Again this is likely due to a change in the stimulus materials used in the interaction sequences involving dyad D. A marginal acceleration in the use of words is apparent in the data recorded following training in the use of teaching strategies for this pair of dyads.

FIGURE 19

CHANGES IN UTILIZATION OF COMMUNICATION MODES BY PAIRS OF DYADS



Regarding Research Question 8b, improvement in the children's use of communication mode was noted in all four dyads. With the possible exception of proportional data on child A's use of vocalizations and words, these improvements were not strongly associated with mothers involvement in the natural teaching strategies component of the intervention.

All four dyads demonstrated increases in the ratio of mode-matched to nonmatched exchanges during the course of the study (Research Question 8c). Figure 20 depicts the pattern of change in communication match for pairs of dyads receiving intervention in the same order. Dyads A and D demonstrated marked increases in mode-matched exchanges when observed shortly after completing the natural teaching strategies component of the intervention. Mode-matched exchanges increased at a relatively even rate across both interventions for Dyads C and B.

With respect to Research Question 8d, increased length of turn was noted for three of the four dyads. These increases were associated with the natural teaching strategies component for dyads B and C, only.

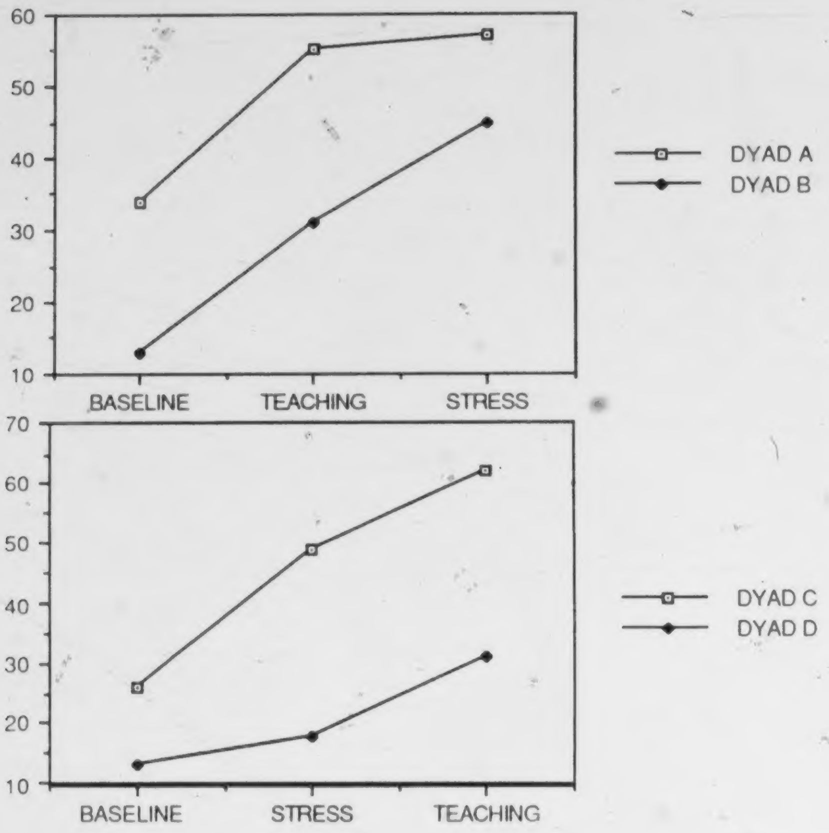
Finally, individual analysis suggests that two of the mothers appeared to modify their use of teaching strategies in the desired direction upon completion of that phase of the intervention (Research Question 8e). Dyads A and C used a greater number of models, imitations, pauses and vertical expansions, while demonstrating fewer undifferentiated responses. Dyads B and D on the other hand utilized a greater number of signals.

In summary, the results of the parent-child interaction sequences did not provide evidence of the "dramatic and immediate effects" needed to establish a clear treatment effect. Nonetheless two of the four mothers appeared to have modified their behavior in the desired direction.

An inspection of the data for individual dyads suggested that the change in the utilization of communication modes for dyads A and C was both greater, and more

FIGURE 20

CHANGE IN THE RATIO OF MODE-MATCHED EXCHANGES



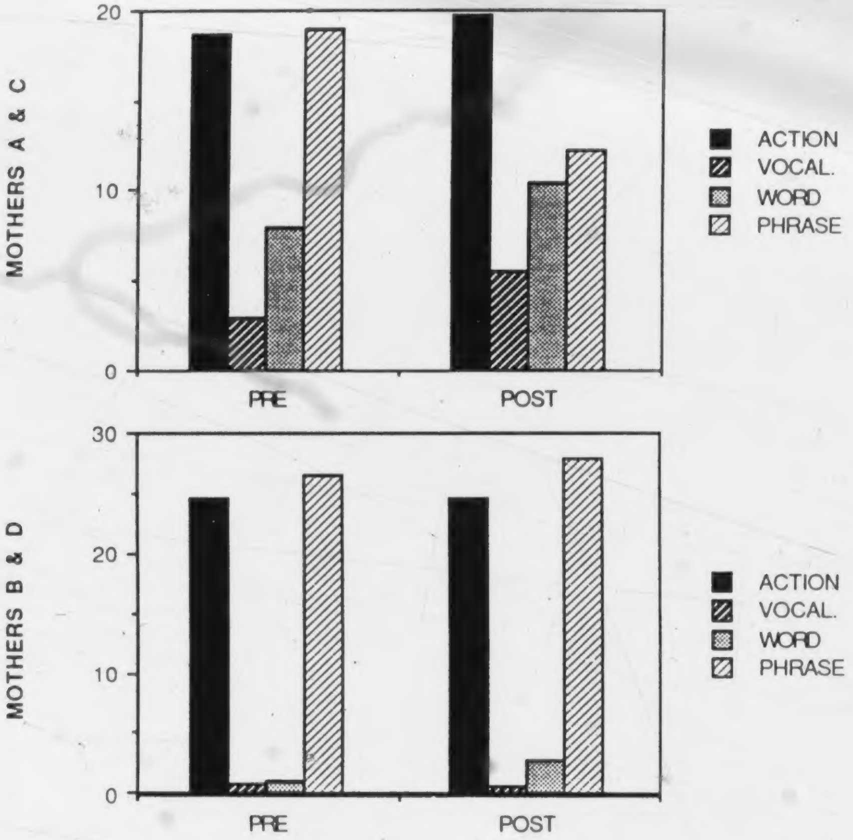
consistent with the content of the natural teaching strategies component of the intervention, than that of dyads B and D. To investigate this possibility mean frequencies were calculated for this combination of dyads for interaction sequences recorded before and after the teaching intervention. The predicted pattern of an increase in the utilization of vocalizations and words accompanied by a marked decrease in the use of phrases is clearly evident for dyads A and C (see Figure 21). In addition, changes in the use of teaching strategies demonstrated by these mothers were also more consistent with the content of the intervention.

Since these two mothers received the intervention in reversed order, and from different trainers the results suggest that the effect of intervention on these two mothers cannot be attributed to either order of treatment, nor the impact of a specific trainer. In addition, all four mothers received similar training, while only these two demonstrated the expected pattern of change in the use of communication mode. Factors beyond the content of the intervention need to be considered in accounting for these apparent differences in treatment effect.

Possible explanations for the apparent differential effect of treatment on the dyads will be presented in the following chapter. Similarily, chapter 6 will present a summary and integration of the results of each component of the study prior to any discussion or interpretation.

FIGURE 21

FREQUENCY OF MODE USE FOLLOWING NATURAL TEACHING STRATEGIES



Chapter 6

DISCUSSION

The purposes of the present investigation were twofold. The results of a number of self-report measures related to the T-Double ABCX Model of family adaptation were compared to data from a prior study (Reddon, 1989), and to normative information, where it was available. These comparisons were carried out to determine if a common pattern of stress, coping and resources emerged between the two studies, or if the parents who expressed interest in becoming involved in interventions designed to reduce stress differed significantly along these dimensions. The second major purpose of the study was to evaluate the effect of interventions involving stress management training and natural teaching strategies on self-report measures of stress and coping, as well as videotaped sequences of parent-child interaction.

The following chapter will discuss the results of this study with reference to each purpose. In addition, the limitations of the study will also be examined, along with directions for future research.

Discussion of Results

Descriptive Data

Demographic data indicated that the parents involved in both the Family Intervention Project and the Reddon (1989) study were mature, relatively well educated, and secure financially. Considerable variability in income and educational levels was also common to both studies. Unlike the group of two parent families involved in the prior study, the present investigation included the responses of two single mothers and three unemployed fathers

While the children were also very similar in terms of age, differences were apparent in their level of intellectual development. In the Reddon (1989) study the mean mental age of the children, as measured by the BSID was approximately one half of their chronological age. In contrast, mental ages could not be established for over one half of the children in the present study. While two of these children were untestable due to a lack of functional vision, the remainder of the children exceeded the limits of the BSID. In fact, school records indicated that three of the children were mildly intellectually delayed, although accompanied by moderate to severe communication and/or behavioral problems.

It is unlikely that differences in intellectual functioning had a significant impact on parental stress. The literature suggests that the relationship between parental perceptions of stress, and global measures of functioning is weak. Abidin (1986), for example, found that compared to other parents of special needs children, parents of hyperactive or behavior disordered children obtained the highest levels of stress related to child characteristics. Frey et al., (1989) failed to find a significant relationship between maternal stress and the child's level of adaptive functioning as measured by the VABS. A significant relationship was found, however, between the mothers perception of stress and the communication subscale of the VABS suggesting the importance of specific child characteristics.

Mean scores obtained on the subtests of the Child Characteristics Domain of the PSI obtained for both the Family Intervention Project and the prior study were in fact very similar. Consistent with the pattern described in the PSI manual, as well as the results of prior investigations with parents of handicapped children (Cameron et al., 1989; Kazak & Marvin, 1984; McKinney & Peterson, 1987), elevated levels of stress associated with child characteristics were apparent in the results of both studies.

Differences worthy of note did exist between the two studies on measures of stress related to the Parent Characteristics Domain. Confirming the results of a number of recent investigations (Damrosch & Perry, 1989; Kazak & Marvin, 1984), mothers in the Family Intervention Project reported higher levels of stress associated with the spousal relationship and appeared to feel somewhat more depressed than the fathers in the sample. In addition, fathers in the present study reported significantly higher levels of isolation, while the mothers in the sample felt less restricted in their parenting role.

Why the mother/father patterns of stress obtained for the Family Intervention Project deviate from the results of the Reddon (1989) study is difficult to determine. Higher levels of maternal depression and stress associated with the spousal relationship is consistent with the suggestion that parenting a handicapped child may have a different meaning for mothers compared to fathers (Damrosch & Perry, 1989). High isolation scores obtained by the fathers in the sample appears to be related to the demographic data presented earlier. Lack of employment for at least three of the fathers in the Family Intervention Project could result in increased time spent with the handicapped child, as well as a decrease in the availability of social support from extrafamilial sources.

The similarities in the levels and patterns of social support reported for the two samples were perhaps more remarkable than the differences. Supporting the suggestion that informal supports are of critical importance to family adaptation (Friedrich, 1979; Kazak & Marvin, 1984), parents in both studies reported that they obtained the greatest degree of social support from intrafamilial sources. Mothers were more likely than fathers to seek support from friends and professional sources, while fathers obtained significantly more support at the work place.

The mothers involved in the Family Intervention Project, however, were less likely to obtain support from community or neighborhood groups, while fathers reported somewhat less support from children, relatives, and co-workers.

These differences were consistent with the fathers employment status and the results of the PSI. It seems likely that lower levels of social support would be related to feelings of isolation. Similarly, mothers who feel less restricted in the parenting role may not feel as great a need to seek support from neighborhood groups, than mothers who feel somewhat more constricted by their child-care responsibilities.

In terms of the coping skills employed by these families to manage the stresses associated with parenting a handicapped child, there was evidence that the parents in the present sample utilized one coping strategy to a somewhat greater extent than either the normative sample, or the parents in the Reddon (1989) study. This coping pattern involves efforts to maintain relationships with health care professionals and other parents of handicapped children. While the degree of difference only approached significance, it seems reasonable to suggest that parents attracted to this type of intervention are more likely to utilize this coping strategy.

Within the McCubbin/Hill framework the final outcome of the interaction of factors related to stress, coping and resources is family adaptation. Both studies used the Family Assessment Measure (FAM) to determine the level of family adaptation in each of their respective samples. In keeping with the similarities noted on the other dimensions of the T-Double ABCX Model, neither study reported evidence of significant rates of family dysfunction.

Interestingly, the three fathers who participated in the intervention obtained marginally higher scores on all three scales of the FAM. Generalizations based on these results are obviously limited by both the numbers of participants and the magnitude of the difference. Nonetheless there is support in the literature for the notion that more "involved" fathers experience a lower sense of marital satisfaction. Waisbern (1980) in her study of Danish and American families with young handicapped children found that fathers who engaged in more activities with their child also felt that the child placed a greater strain on their relationship with their wives.

While the parents in the Family Intervention Project appeared to be generally satisfied with their own functioning within the family unit, as well as that of their spouses, some caution in interpreting these results is warranted. The failure of two of the participants to return completed questionnaires raises questions about the representativeness of the data. Reluctance to disclose information about a dysfunctional relationship must be considered as one plausible explanation for the incompleteness of the data sets.

Effect of Stress Management Training on Self-Report Measures

The evidence of a significant change in the self-report measures related to the T-Double ABCX Model, following stress management training can best be described as modest. Eight of eleven participants obtained decreased scores on stress related to child characteristics on the PSI. In addition, parents appeared to feel less stress associated with the spousal relationship, as well as an increase in the tendency to view their child as reinforcing.

While these results are certainly consistent with the nature of the intervention, significant reductions in stress associated with other child characteristics would also be expected given the content of the interventions. During the sessions each of the coping strategies was discussed and demonstrated with specific reference to the issues of child distractibility, demandingness, and acceptability. Significant reductions in stress associated with these child characteristics, however, did not occur. Possible causes for this apparent lack of treatment effect will be explored in the section dealing with the limitations of the study.

Changes in the levels and patterns of social support were equally modest. A trend towards increased support from special groups was noted in the results of the SSI. However, a significant increase in support from a source identified as church/synagogue, accompanied by an equally significant decrease in support from spiritual faith/people who share common beliefs was unexpected. This latter subscale contains only five items tapping two sources of support, spiritual faith and shared beliefs. Low numbers of items, and the possibility that participants may be responding differentially to each of these sources of support makes it difficult to draw valid inferences from the results of this subtest. Together, however, the post-intervention pattern of results on the SSI appear to suggest a movement away from informal sources of support and towards formal sources such as institutionalized religion and special groups.

The results of measures related to family resources and coping patterns provides limited supporting evidence of a shift in social support . A non-significant trend towards an increase in family resources associated with a sense of mastery and health, along with a decrease in support from extended family members was noted in the results of the FIRM. In addition, post-intervention results of the CHIP suggested an increase in Coping Pattern III: Medical Knowledge, which includes efforts to maintain relationships with other parents of handicapped children.

The combined results of the CHIP, FIRM, and the SSI suggest a movement from informal sources of support including co-workers, and extended family members, towards formal sources such as special groups, and organized religion. However, small sample size and the possibility that these findings may be an artifact of the large number of variables analyzed suggests the need for caution about any inferences drawn from these results.

While the evidence for a change in the pattern of social support is suggestive at best, a shift in this pattern could have theoretical and practical implications. An increase in support from special groups and greater utilization of a coping pattern which includes efforts to maintain relationships with other parents of special needs children is consistent with a treatment directed at enhancing social support through group interaction. The increase in support from church/synagogue was somewhat surprising, however, particularly in the light of at least one recent study. Mines (1988) found that support derived from church affiliation was associated with higher levels of maternal stress related to providing care for a handicapped child over his/her life-span.

A shift from informal to formal sources of support would be congruent with the theories of Bronfenbrenner (1979) in which alterations in any part of the social system surrounding the parent and child reverberate throughout the whole system. Such a change, however, may not be desirable. A number of recent investigations have failed to find a relationship between the availability of formal supports and a reduction in parental perceptions of stress (Bristol, 1987; McKinney & Peterson, 1987; Mines, 1988). Further, it is conceivable that involvement in formal support groups may use up resources and energy that might otherwise be devoted to the maintenance of informal support systems. Optimum treatment effect would include enhancement of both formal and informal support systems. Clearly, the results obtained here tend to reinforce the suggestion of Dunst (1986) and his associates that the role of different forms of social supports in the adaptation of families with handicapped children needs to be clarified.

Effect of Natural Teaching Strategies on Self-Report Measures

Using the probabilities associated with a Sign Test as a reference, no statistically significant results were obtained on self-report measures completed prior to and following the implementation of the teaching strategies phase of the intervention. If, however, change in a consistent direction for five out of the seven participants is considered to be suggestive of a treatment effect there appear to be trends in the data worthy of note.

With reference to the pile-up of stressors, this proportion of participants demonstrated a decrease in stress associated with feelings of competence. Surprisingly, five out of seven of the participants also reported an increase in stress related to child distractibility. While the enhancement of feelings of confidence has been associated with parent interventions involving both reflective and child-level behavioral approaches (Cunningham, 1985), the increases in stress associated with child distractibility warrants further consideration

As the literature review indicated, high levels of maternal stress have been associated with increased directiveness in play and teaching situations (Crnic et al., 1983), as well as decreased sensitivity to infant cues (Oster, 1985). In addition, Mahoney (1988) found that parents rated highest on measures of enjoyment of their children, appropriateness of stimulation, and sensitivity to child state were also found to be the most effective in implementing strategies similar to those taught in the present intervention. The inverse relationship, however, between implementation of child-level interventions and measures of stress associated with child characteristics has not been explored. It is possible that implementation of prescribed interventions, even those designed to enhance reciprocal interactions, can heighten parental sensitivity to child characteristics such as distractibility. Again the influence of chance factors on these results cannot be overlooked.

Intervention Effects on Parent-Child Interaction

In general, parent-child interaction appeared to be more balanced at the end of the study compared to baseline observations. The ratio of balanced to unbalanced exchanges improved for all four dyads, while the Mean Length of Turn (MLT) increased for three out of the four mother-child pairs. While these are certainly desirable outcomes, the changes noted cannot be attributed exclusively to the effect of the intervention.

Since the intervention required the direct involvement of only one member of the dyad, the mother, changes in her interactive behavior would appear to be a critical factor in determining treatment outcome. In the present study increases in the balanced to non-balanced exchange ratio were not differentially associated with the mothers participation in the natural teaching phase of the intervention for all of the dyads. Further, improvements in the quality of parent-child interaction were associated with enhanced use of teaching strategies by only two of the four mothers. Therefore it is necessary to consider extraneous factors such as maturation and the effect of ongoing involvement in community intervention programs in interpreting these findings.

Effect of Intervention on Dyads A and C

As mentioned previously enhanced communicative match accompanied by an increase in maternal use of teaching strategies did occur in two of the four dyads. Among the factors that need to be taken into consideration in attempting to account for the differential effect of treatment are the characteristics of the child, as well as the parent's prior exposure to similar treatments.

With reference to child characteristics, both child A and C had the same obvious handicapping condition (Down Syndrome). At 37 months and 32 months respectively, they were 10 to 21 months younger than the other children examined in this segment of the analysis.

Previous intervention efforts involving interactional match and turntaking have generally involved children aged thirty six months or younger (Holdgrapher et al.,1989; Mahoney, 1988). The study by Girolametto (1988) included children that ranged up to 62 months, however, individual variation in treatment effect was not explored with respect to the ages of the children.

It is possible that intervention efforts focusing on joint attentional routines might be more effective with children who are both developmentally and chronologically younger. In addition, such interventions might have greater "face validity" with parents of younger children with obvious handicapping conditions.

Another child-related factor that requires consideration is the variation in language skills. Analysis of videotaped interaction sequences suggested that both child A and C were functioning consistently at a preverbal or single word level. In contrast, the other two children appeared to have more circumscribed language difficulties related to articulation. It is possible that the parents of the children with articulation difficulties, through familiarity, are able to understand and respond appropriately to the child's verbalizations. A naive observer, on the other hand, unable to interpret the child's vocal behaviors would be required to record a mismatch in communication mode.

Alternatively Girolametto (1988) has suggested that the child's socio-conversational style might be the deciding factor in the selection of the caregivers communicative strategy. In accounting for the variation of maternal strategies observed during a similar intervention, this investigator hypothesized that children with different socio-conversational skills may elicit different but equally effective patterns of interaction with their conversational partners. For example, greater use of signals by mothers B and D may represent the minimal effort required to keep their child involved in the exchange. A coding system designed to measure use of specific interactive behaviors would likely be insensitive to these variations

Finally both mothers had prior exposure to at least some of the techniques presented as part of the intervention. This suggests that the present study served to cue , and consolidate these prior learnings. As a result, it is difficult to attribute the modifications these two mothers demonstrated in their interaction patterns to the influence of the present intervention alone.

Limitations

Procedural Limitations

There were a number of procedural limitations that may have affected each component of the investigation. The major limitations common to the entire study include the small size, and representativeness of the sample, as well as the psychometric properties of some of the instruments used.

Limitations of the sample. Small sample size is a serious limitation that has an impact on the types of analysis that may be carried out on the data and any generalizations that are drawn from these results. Given the sample size outlying scores pose a threat to statistical analysis involving a comparison of means. Similarly, in the post intervention analysis a single tied score can determine the significance or the nonsignificance of a set of findings.

An associated limitation is the representativeness of this sample. As noted in the previous discussion, both the present investigation and the prior study by Reddon (1989) involved families with relatively high levels of education, financial security and other forms of family resources. This raises the possibility that a picture is being formed of a subsample of families with handicapped children. Single parent families, the poor and families with marital dysfunction may not be fully represented in the data presented here. The results of these studies may therefore be skewed towards well integrated families from the upper levels of the socio-economic spectrum.

The problem of representativeness is further exacerbated in the present investigation by attrition. The participants that completed one or more phases of the intervention are likely to be particularly resilient.

Limitations of Dependent Measures. Efforts to determine the levels of coping and resources in these families is hampered by the lack of comparative information on the families of non-handicapped preschool children. The CHIP, FIRM, and SSI were normed on families with seriously/chronically ill children. As a result, it is difficult to determine if the contributions of various family resources, social supports, and coping patterns are unique to families with child-related chronic stressors.

Recent literature indicates that fathers appear to interpret and respond to the presence of a handicapped child in the family differently than mothers (Damrosch & Perry, 1989). Instruments such as the CODQ and the PSI fail to provide adequate normative information on fathers. Considering that the well-being of the family system potentially depends on the father's material, instrumental and social support, the absence of normative data is a significant limitation.

Limitations of the Intervention Component of the Study

In discussing the limitations of this component of the study it is important to emphasize that the combination of training in stress management techniques and interactive strategies appears to be unique. The intervention phase of the present investigation may rightly be considered exploratory.

The limitations to be discussed in the following section include the research design, outcome measures and problems related to the content of the intervention.

Research design. Data from the project was analyzed using a one-group pretest-posttest design. This design fails to account for a number of threats to validity including history, maturation, testing and other factors (Borg & Gall, 1989). While the inclusion of multiple measures, and measurement at several points provided some control over these threats, designs employing controls, alternate treatment groups or case studies utilizing multiple baselines would be required to establish unequivocal evidence of treatment effect.

Outcome measures. Apart from the lack of normative data described previously, other aspects of the measurement procedures used in this study need to be examined. Some of the problems associated with measurement in this study include the sensitivity of the self-report measures, reliability of some of the behavioral categories used in the coding of the parent-child interaction sequences, as well as the sheer volume of measures used.

The ability of these instruments to detect subtle alterations in parental adaptation to stress may be uncertain. For example, changing the parents frame of reference has been advocated as a potentially effective form of intervention (Frey et al.,1989; Singer, 1988). In the present study a global measure of appraisal, the CODQ, was used to determine treatment effect on the parental appraisal. Changes in parental appraisal resulting from short term treatment, however, would likely occur at a situational rather than a global level. Specific measures linked directly to treatment procedures appear to required to evaluate the more immediate impact of intervention

Determination of treatment effect on parental perception of stress almost by definition requires subjective evaluation. This suggests the need for greater utilization of qualitative approaches as well as social validation data on the effectiveness of treatment procedures (Singer, 1988)

Based on data gathered from group evaluation and direct communications with parents, the numbers of self-report instruments they were required to complete appeared to be an inconvenience. Apart from the minor hardship this might present to parents, it raises a concern about response bias related to the fatigue of filling out numerous questionnaires. Future research efforts in this area might consider using measures with fewer items such as the Family Relationship Inventory (Frey et al., 1989) or measures such as the 48 item Questionnaire on Resources and Stress-Short Form (Salisbury, 1986) that incorporate several aspects of stress and coping.

The problems associated with measurement of parent-child interaction are not limited to the reliability issues described in the methodology section. Coding systems that involve simple frequency counts and ratios may fail to capture the nuances of the communicative act. For example, a signal followed by a pause might be an effective means of eliciting a response from a child, however, a series of signals and pauses is a testament to the ineffectiveness of the interaction. The coding systems used in the measurement of parental use of teaching strategies did not allow for this level of analysis.

Content and Implementation of Stress Management Training

Surprisingly the impact of stress management training on total levels of parental stress as well as the stress associated with child characteristics was not as great as would be anticipated given the results of previous research (Singer, 1988). Reasons for this lack of significant effects may be related to several factors including the length and intensity of treatment, as well as treatment fidelity.

In the present study parents received instruction in three coping strategies designed to manage stress. Training involved six one and one half hour sessions over a period of five to six weeks. In contrast Singer (1988) provided training in relaxation techniques and cognitive restructuring during two hour sessions over ten weeks. Similarly, the Kirkham et al. (1986) study, which involved training in only two of the coping strategies presented in the present intervention, was carried out over a period of eight weeks.

Not only the length but also the comprehensiveness of treatment needs to be considered. Meichenbaum and Deffenbacher (1988), for example, recommended that training in the use of cognitive restructuring should include problem orientated self-instruction, as well as the reframing of negative cognitions. The present investigation focused almost exclusively on the restructuring of stress inducing cognitions. Similarly, in the Singer (1988) study, progressive relaxation was taught in a graduated three step approach moving from a long form of relaxation to a short form that could be used in domestic and work situations. In contrast in the Family Intervention Project the long form of progressive relaxation was taught in a single session, and practiced throughout the remainder of that phase of the intervention. These discrepancies in the way the same treatment is presented indicates the need to determine which components of the intervention are essential for therapeutic effect.

Content and Implementation of Natural Teaching Strategies

The major limitation of the natural teaching strategies component of the present intervention is the difficulties inherent in providing a prescribed approach to parents with very different skills and abilities, and children with a wide range of needs and developmental levels. Girolametto (1988) has pointed out that programs that dispense general information on intervention strategies may obscure differences in children and set up situations that "potentially conflict with the reality of the child's socio-conversational style"(p. 165).

Although there is support in the literature for the effectiveness of each of the strategies presented, it is unlikely that all parents require equal amounts of instruction in each of these strategies. More importantly, it is equally unlikely that all parents perceive the appropriateness of these techniques.

This limitation may have been overcome by direct involvement of the child in the teaching strategies component of the intervention, or through in-group analysis of videotaped interaction sequences. Either of these approaches may have enhanced the "face validity" of the procedures, allowed for individualization of treatment, and encouraged generalization. The literature on enhancement of parent-child interaction provides considerable support for the use of videotapes to provide monitoring and feedback (Girolametto, 1988; Kysela et al., in press, Mahoney, 1988)

Directions for Future Research

Because of the number of variables considered in this investigation, a comprehensive review of the implications for future research is beyond the scope of the present chapter. However, the results of this study as well as the related literature raise two major areas of concern for future research. These areas include the content of the interventions and the problem of enhancing parent participation

Content of the Intervention

The literature related to stress and coping lends considerable support for the types of interventions used in the present study. However, although some gains were noted on the self-report measures and in the parent-child interaction sequences, the changes were relatively limited. These results, as well as the literature published since the inception of the project suggest the need to examine the content of the intervention in the areas of social support, cognitive processes related to coping and teaching strategies.

Social support. While the importance of social support to family adaptation and parental coping has been a consistent finding in the literature, a question remains about the type of social support most appropriately targeted for intervention. Several investigators have found that informal supports are negatively correlated with stress, and that families with adequate levels of informal support tend to reduce their dependency on formal sources (Dunst et al.,1986; Mines, 1988). Schilling et al. (1984) provides clinical data that parents of handicapped children can be taught to enhance their existing social support networks. Together these studies suggest the need for researchers to turn their attention to developing empirically validated methods for maintaining and enhancing informal sources of support including spouses, extended family members and friends.

Cognitive processes. In their study of the factors related to coping, Frey et al. (1989) suggested that the most effective forms of intervention may be the enhancement of comparative frames of reference and cultivating a sense of perceived control. Similarly others have found that an internal locus of control has been associated with better family relationships (Friedrich et al.,1987) and a higher sense of maternal competence (McKinney & Peterson, 1987). This suggests that effective forms of intervention may need to include techniques for accessing services, dealing effectively with professionals, and other methods for developing a sense of empowerment.

Teaching strategies. The major focus of the teaching strategies component of the present investigation was to encourage the development of turn-taking and interactional match. The extent to which these strategies were effectively applied appeared to be at least in part related to characteristics of the child. There appears to be a need to establish the effectiveness of this approach with children from various diagnostic groups, as well as children who differ along a dimension that Girolametto (1988) referred to as socio-communicative style.

Parent Participation

Of considerable practical importance are the logistics of organizing effective support groups for parents. General agreement in the literature can be found for the notion that care-giving demands are a significant source of stress in families with handicapped children (Beckman, 1983; Quine & Pahl, 1985). There is a danger that participation in interventions designed to enhance family resources and parental coping may actually add to these demands. It appears critical that every effort is made to insure that participation in this type of intervention is not seen as additional source of bother and inconvenience.

In the Singer (1988) study, social validation data indicated that respite care was among the most highly rated components of the intervention. Cunningham (1985) in his review of the literature on training and educational approaches for parents of handicapped children, suggested that attrition rates can be reduced through personal contact and referral, as well as access to both transport and child-care. Given these factors it seems reasonable to suggest that interventions designed to enhance family resources and parental coping have a greater chance of success if they are seen as an integral part of ongoing support and intervention services.

Another concern in attempting to develop effective interventions for parents of handicapped children is the match between parental needs and program content. In a qualitative study, Nixon (1988) found that parents of visually impaired children demonstrated a great deal of variability in levels of commitment to support groups and the rationale given for becoming involved in these types of programs. While some parents were described as committed joiners, others were interested in acquiring practical knowledge, while still others were involved only at the insistence of a spouse. In addition, this author described different styles of group participation ranging from passive to disruptive. Within the context of the present study there appears to be a need to determine which parents are compatible with what type of stress management intervention, or alternately, how can the format of the intervention be modified to accommodate various needs, interests and styles.

Conclusion

The complex and often contradictory nature of the literature on the effects of the handicapped child on the family has lead to the need for multidimensional frameworks of stress and coping. The present investigation and a prior study by Reddon (1989) used one such framework, the T-Double ABCX Model, to reveal an essentially common pattern of stress, resources and coping in the families of young handicapped children. These families reported moderate to high levels of social support, family resources and various forms of coping behaviors, as well as normative levels of family dysfunction. However, the results of these investigations have also tended to confirm previous findings of significantly higher levels of stress related to child characteristics.

While these conclusions hold true for the general case evidence of social isolation, inadequate coping, family dysfunction, and clinically significant levels of stress were obtained for individual participants in both studies. These findings support the need for interventions directed at reducing stress and managing family resources. The present study evaluated the effectiveness of a multiple treatment approach developed to bolster parental coping skills while reducing stress associated with both the child and the parenting role

The analysis of treatment effects provided limited evidence for the effectiveness of stress management training and the use of a series of naturalistic teaching strategies. The participants appeared to view their child as somewhat more reinforcing, while experiencing less stress associated with their spouse following stress management training. In addition there was some suggestion of an alteration in the pattern of social supports available to these families following this component of the intervention.

Inconsistent results were obtained for the natural teaching phase of the intervention. A detailed analysis revealed a change in the pattern of interaction consistent with the content of the intervention for two of the four mother-child dyads

While sample size and methodological limitations preclude definitive statements about the presence or absence of treatment effects, this investigation appears to provide direction for future research and intervention efforts. The problems encountered in attracting and maintaining participation over the course of the study emphasizes the need to design interventions that blend in with, and complement existing support systems. The differential effects of treatment also underscores the need for a individualized approach which matches the intervention to the needs, ongoing family demands and the personal styles of the participants.

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APPENDIX A

LETTER OF INTENT AND CONSENT FORM

Dear Parents:

As you know, over the past several years, a variety of programs and services have developed to provide support to families with young children having special needs or handicaps. We have been actively involved in these services ourselves, and in order to aid in their ongoing development, we would like to learn more about families and their experiences with their special needs children.

We have initiated a family intervention project in which we are looking at the stress and strains families have encountered in raising their child with special needs or handicaps, and the ways in which families cope with these demands. Since every child and her/his family have unique characteristics, we would like to learn more about these characteristics as well as the professional and personal support networks (including programs) that are available to you and your child.

We would also like to learn more about the value of two recent approaches to family services. One approach involves a six-week parent support group that will help families examine how their child with special needs impacts on the family in both positive and negative ways. Coping strategies, relaxation techniques and problem solving approaches will be discussed and practiced during this session. The other approach will involve a six-week session focusing on effective ways of interacting with and teaching skills to young children with special needs in day-to-day situations. Parents will discuss and practice these skills during the sessions and at home with their own child.

Thus, we are asking for your participation in this family intervention project. Your participation would involve an introductory meeting, a six-week block of time (one meeting per week for six weeks) and a second six-week block of time (one meeting per week for six weeks) about six weeks after the first session. One set of meetings would focus on parent support, and the second set would focus on natural teaching strategies. A qualified project intervention staff member would conduct these meetings at mutually agreeable times in a central location. In addition to the meetings, involvement in the family intervention project would include the following assessments:

1. We will arrange the first meeting in your home to explain in further detail each aspect of this project and to allow you to make a final decision concerning your willingness to participate. If you agree, we will begin an assessment of your child at this time (see #3).
2. At various times throughout the project you would be asked to complete an interview and some questionnaires relating to coping strategies, social supports, stress. The total time for completing the interview and questionnaires is approximately two hours.
3. We would like to complete an assessment of your child's developmental status at the beginning and end of the project. The assessment would be done by a member of the assessment team and would last forty-five minutes to an hour. Parent-child interactions will be included in the assessments.

All assessments would be completed between December, 1988 and June, 1989.

Your participation in this project is completely up to you, and you would be free to withdraw at any time. All of the information obtained in this project is confidential. Your names would not be placed on any of the measures described above, thus ensuring anonymity and confidentiality. All data collected will be put together and dealt with as a large group of participants. We plan to use the information collected on the value of the parent support group and natural teaching strategies group to assist early intervention programs and other parents with special needs children.

We plan to begin our work with the new families as soon as possible. Your participation and cooperation in this project would be greatly appreciated and will assist us in developing more sensitive and individualized services for children with special needs and their families.

Thank you for the time you have taken to read this letter and we look forward to your participation in this project.

Sincerely yours,

Gerard M. Kysela, Ph.D.	Linda McDonald, Ph.D.
Professor	Assistant Professor
432-5026	432-2198

/lm

CONSENT FORM

We ______________________ may wish to participate in this family intervention project. We would like to participate in the first meeting and make our final decision following that information sharing session. We may be reached at the following numbers(s)

Home _______________

Work _______________

Please return this form to Dr. Gerard Kysela in the self-addressed stamped envelope included with the letter.

APPENDIX B

ORIGINAL PLAN FOR SEQUENCING OF ASSESSMENTS

Family Intervention Program - SSHRC

ASSESSMENT SEQUENCE

TEST # 1	TEST # 2	TEST # 3	TEST # 4	TEST # 5
BSID		VABS		BSID
Interv	Brief T	Brief F	Brief T	Brief F
PSI	FAM	PSI	FAM	PSI & FAM (?)
CHIP		CHIP		CHIP
FIRM		FIRM		FIRM
SSI		SSI		SSI
CCDQ		CCDQ		CCDQ
Par/Ch		Par/Ch	Par/Ch	Par/Ch
Int	Int	Int		Int

BSID- Bayley Scales Of Infant Development

VSMS- Vineland Adaptive Behavior Scale

Interv- Interviews with brief follow-up interviews focused on specific treatment or follow-up issues

PSI- Parenting Stress Index

FAM- Family Assessment Measure

CHIP- Coping-Health Inventory For Parents

FIRM- Financial Inventory Of Resources For Management

SSI- Social Support Inventory

CODQ- Concepts Of Development Questionnaire

Par/Ch- Parent - Child Interaction Analysis; two Int. scales: interaction and strategies

APPENDIX C

ASSESSMENT PROTOCOL

ASSESSMENT #1

PROTOCOL

Visit 1

(1) Ascertain parent(s) understand nature of research and time commitment involved. Initial explanation will be expressed as follows:

> Our project is designed to test the stress and strains encountered by families in raising children with specialneeds. We will also test unique family characteristics as well as professional and personal support networks available to families.
>
> In addition, we would like to learn about two recent approaches to family services. One of these is a six week parent support group which will help families examine the ways in which their child with special needs impacts on the family. The other approach is a six-week session focusing on effective ways of interacting with and teaching skills to young children with special needs.
>
> Your participation will involve two six-week sessions, comprised of one meeting per week. The first session will be in October/November and the second session will be in February/March.
>
> At specific times throughout the project we will also conduct assessments. There will be three different types of assessments:
>
> 1. The parents will be interviewed at the beginning of the project. They will also be asked at various times to fill out questionnaires related to coping strategies,social supports, and stress (show questionnaires).
>
> 2. An assessment of the child's developmental status willbe conducted at the beginning of each session and at the end of the project using the Bayley Infant

Scale (show Baley forms and kit. The Vineland Scale will be used once, in the middle of the project (February, 1989).

3. A brief assessment of parent/child interactions will be conducted at four times during the project by video-taping short segments of interactions between the parents and child. This taping will be carried out at the University, if it is acceptable to you, during the first group session.

All information collected is confidential, and names are not placed on any of the measures. Should you agree to participate, you are not obligated to participate in any task with which you do not feel comfortable.

(2) Determine if parent(s) are still interested in participating, and if so, get signed consent form.

(3) If conditions in the home and state of the child seem amenable to testing, begin administration of Bayley.

(4) To obtain some closure, give general information regarding Bayley results and answer any remaining questions.

(5) Leave three questionnaire forms for parent(s) to complete, including the PSI.

(6) Arrange mutually convenient time for second visit.

Visit II

(1) Collect completed forms and discuss any questions or concerns related to the forms.

(2) Leave copies of two remaining questionnaires.

(3) If necessary, finish administration of Bayley.

(4) Complete Parent Interview. (This may require a third home visit if completing the Bayley takes more than 30 minutes).

(5) Confirm video session at University (or possibly the home).

Visit III

(1) Providing no further home visit is required, parent(s) and child come to the University for videotaping.

(2) Parent(s) bring completed forms.related to the forms.

APPENDIX D

TRAINING GUIDE AND OPERATIONAL DEFINITIONS FOR THE PRESCHOOL OBSERVATION SCALE

Training Guide and Definitions for the Preschool Observation Scale

Turn- A turn has been defined as " any behavior which is directly responding to that person or is initiating contact with that person, followed by a similar behavior from the responding person".(McCarthy, 1986 p.40). This definition implies that turns occur only in the context of interaction. A reciprocal response from the communication partner is a necessary component of a turn. Thus the initial turn in a turn sequence consists of behavior directed at the other member of the dyad, as well as a topic related response from that partner. Additional turns are added to the sequence as each member responds with topic related behavior. The turn sequence is interrupted under the following conditions:

•There is a cessation, or withdrawal from the interaction of 10 or more seconds.

•Either member of the dyad demonstrates three or more consecutive codable responses without an intervening response from the communication partner.

•One of the partners introduces a novel action or topic, which does not appear to be directly related to the other partners previous behavior.

Communication mode- Turn behavior (ie any behavior which is directly responding to that person or is initiating contact with that person, followed by a similar behavior from the responding person) may be classified according to four modes or levels of complexity

•**Action (A)**- A non-verbal motor gestural behavior that appears to be either elicited by, or in response to the communication partners immediately previous behavior. Examples include pointing, waving, pushing a toy or object towards the communication partner etc.

•Vocalization (V)- A single sound or group of sounds which is not recognizable as a word, and does not appear to be an approximation of a word. Examples include "yeah", "uh uh", "oh oh", etc.

•Word (W)- A single word or word approximation. Approximations must be clearly recognizable as an attempt at a word that makes sense within the context of the ongoing interaction. For example "ba" for ball would be accepted as an approximation if the exchange involved a ball or ball like object. In addition, repetitions of the same word that occur not more than 3 seconds apart would be counted as a single word.

•Phrase (P)- A phrase of two or more words.

Turn Sequence

A turn sequence may be either mode matched or non mode matched, depending on the degree of discrepancy between the mode of communication used by the partners during an exchange. Any exchange may be classified into the following dichotomous categories.

•Mode matched- An exchange in which the response of one member of the dyad is within one communication mode of the other partners previous behavior. The following examples illustrate mode matched exchanges;

#1 Child: "juice" (word)	Mother: "want juice" (phrase)
#2 Child: points at ball (action)	Mother: "ba" (vocalization)

•Non Mode matched- An exchange in which the difference between one partner's behavior and the topic related response of the other partner is two or more communication modes. For example;

#1 Child: "ju" (vocalization)	Mother: "Oh, you want juice" (phrase)
#2 Child: points at ball (action)	Mother: "ball" (word)

Turn behavior will be further coded into two, mutually exclusive categories. Interactive behavior which is directed towards the other communication partner is either an initiation, or a response. These categories are defined in the following manner:

Initiate(I)- Behaviors in one of the communication modes that is directed at the other communication partner but not apparently elicited by that persons verbal or non verbal behavior. An initiate represents the introduction of a novel behavior, or change in "topic".

Response(R)- A topic related behavior in one of the communication modes described above which was apparently elicited by the partners verbal or non verbal behavior.

Coding procedure

Since a turn is defined within the context of reciprocal interaction continuous recording of both partners codable behaviors will be carried out for each two minute interaction sequence. Each behavior will be recorded in two ways

1/ Whether the behavior is an initiate or a response.

2/ The mode of the behavior.

Additional Guidelines

Determining length of turn sequence

1/ When coding has been completed for a two minute segment of interaction the length of turn sequence may be determined following the rules outlined under the definition of a turn, i.e.

•There is a cessation, or withdrawal from the interaction of 10 or more seconds.

•Either member of the dyad demonstrates three or more consecutive codable responses without an intervening response from the communication partner.

•One of the partners introduces a novel action or topic, which does not appear to be directly related to the other partners previous behavior.

2/ Pauses of 10 seconds or more are indicated by drawing a line through adjacent boxes.

Examples of Turn Sequences

a/ No turn

Adult	Child
[✓ I] R	I R
A V W [✓ P]	A V W P
I R	[✓ I] R
A V W P	[✓ A] V W P
[✓ I] R	I R
A V W [✓ P]	A V W P
I R	I R
A V W [✓ P]	A V W P

b/ One turn

Adult	Child
[✓ I] R	I R
A V [✓ W] P	A V W P
I R	I [✓ R]
A V W P	A [✓ V] W P

c/ Two turns

Adult	Child
I R	[✓ I] R
A V W P	[✓ A] V W P
I [✓ R]	I R
A V [✓ W] P	A V W P
I R	I [✓ R]
A V W P	A [✓ V] W P

MODIFIED PRESCHOOL OBSERVATION SCALE

FAMILY #__________ OBSERVER___________________ DATE ______
SESSION# __________ TOY_________________________ PAGE#______

Time	Adult	Child	Time	Adult	Child
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P
	I R A V W P	I R A V W P		I R A V W P	I R A V W P

TOTALS
Adult A__V___W___P____ Child A___V___W___P___
I____ R____ I____ R_____

Observer's Guidelines

Communication mode- Turn behavior (ie any behavior which is directly responding to that person or is initiating contact with that person, followed by a similar behavior from the responding person) may be classified according to four modes or levels of complexity:

•**Action (A)**- A non-verbal motor gestural behavior that appears to be either elicited by, or in response to the communication partners immediately previous behavior. Examples include pointing, waving, pushing a toy or object towards the communication partner etc.

•**Vocalization (V)**- A single sound or group of sounds which is not recognizable as a word, and does not appear to be an approximation of a word. Examples include "yeah", "uh uh", "oh oh", etc.

•**Word (W)**- A single word, manual sign, or word approximation. Approximations must be clearly recognizable as an attempt at a word that makes sense within the context of the ongoing interaction. For example "ba" for ball would be accepted as an approximation if the exchange involved a ball or ball like object. In addition, repetitions of the same word that occur not more than 1 second apart would be counted as a single word.

•**Phrase (P)**- A phrase consists of two or more words. Each must be recognizable as a word, with clear linguistic intent. For example "up ball" is a phrase, whereas "yeah ball" would be considered a word. Phrases are coded as discrete events under the following conditions:

1) when there is a pause of 1 second or more separating each phrase

2) there has been an intervening behavior from the communication partner.

3) The initial phrase is followed immediately by a non topic relevant phrase.

4) Phrases within the same response that are separated from each other by one second or more, and are not interrrupted by a communicative behavior from the partner are coded as a separate behavior.

Interactive behavior which is either initiating contact, or responding to the partner's previous behavior is coded into two mutually excluxive categories. These categories are defined in the following manner.

Initiate(I)- Behaviors in one of the communication modes that are directed at the other communication partner but not apparently elicited by that persons verbal or non verbal behavior. An initiate represents the introduction of a novel behavior, or change in "topic". Initiates include:

a/ change of topic within a sequence, ie child switches from playing patty cake to pointing to eyes.

b/.change in objects, ie from rolling a ball to pushing a chair.introduction of a novel action with a toy i.e. uses brush as a microphone.

Response(R)- A topic related behavior in one of the communication modes described above which was apparently elicited by the partners verbal or non verbal behavior.

i.e. The child **initiates** by throwing a ball, the parent **responds** by saying "ball".

Note * Consecutive behaviors from the same partner which do not appear to be in response to, or initiating interaction with, the partner are coded separately according to mode only.

APPENDIX E

TRAINING GUIDE AND DEFINITIONS FOR TEACHING STRATEGIES

Training guide and definitions for Teaching Strategies Observations

Model (M)- A novel behavior that is directed towards the partner and is not apparently elicited by the partner's immediately previous behavior, or an elaboration of the child's previous behavior that prompts imitative behavior from the child.

a/ A model must be at, or within one communication mode of the partner's previous behavior.

b/ An elaboration is defined as a topic relevant behavior that does not contain part or all of the child's previous behavior (see expansion).

Imitation (I)- Repetition of all or part of the child's immediately previous behavior or an attempt at a repetition of that behavior. The imitation must occur within 10 secs of the partner's previous behavior.

- •A behavior is not recorded as an imitation if the imitated behavior is separated from the model by one or more codeable responses.
- •Imitations may include only slight alterations in form. Imitated responses that involve a higher communication mode, or that add new information are recorded as expansions (see following Definitions).

Prompt (P)- (McCarthy 1986, p189: Mcdonald & Gillette, 1984)- An action, vocalization, word or phrase which is apparently designed to elicit a response from the child. A prompt is preceded by a previous unsuccessful attempt. The prompt must be topically related to the previous attempt and must be separated from that attempt by two seconds or more.

Types of prompts include:

- Verbal signals including rephrasing or repeating the original request, and directing the partners attention to a particular stimulus with a vocalization, word, or phrase.
- Non verbal signals include gestures such as pointing, shrugging, as well as presenting the object to the partner.

Guide (G)- Physical contact with the communication partner apparently intended to guide the the motor behavior of the partner towards a particular response.

- Physical contact intended to restrain or hold the partner is not considered a guide.

Vertical expansion (VE)- An action, vocalization, word or phrase by one partner which includes the immediately previous behavior of the other communication partner, and adds a topic relevant behavior which is of a higher mode. To be coded as an expansion the behavior must occur within two communication modes of the partner's previous behavior. The expansion must also occur within 10 seconds of the previous behavior

Horizontal expansion (HE)- An action, vocalization, word or phrase by one partner which includes the immediately previous behavior of the partner, adds a mode matched topic relevant behavior and occurs within 10 seconds of the previous behavior. Does not include elaborations (McCarthy, 1986, p 194).

Pause (P)- The presence of a delay of between 3 and 10 seconds following any one of the behaviors described above (does not include undifferentiated responses), before the initiation of another codeable response (including undifferentiated responses).

Undifferentiated Response (R)- Includes any other behavior directed towards the child that does not fit any of the previous categories. These include actions, vocalizations, words or phrases that are intended to recognize, or reinforce the partner's behavior, as well as behaviors that may fit the categories described above but are more than one mode above the child's immediately previous behavior.

Procedure

The procedure for coding teaching strategies observed during turn-taking tasks involves the continuous recording of the parent's communicative behavior during a two minute segment of videotape. The codes correspond to each of the definitions listed above. Each behavior may be coded only once. Thus a behavior may be either an imitation or an expansion but not both. Only the presence, or absence of a topic related behavior will be recorded for the child.

Example of a portion of the data sheet used to record teaching strategies

TIME					
MIN	SEC	ADULT	CHILD	PAUSE	COMMENTS
		HE VE	YES	YES	
		M I S G R	NO	NO	
MIN	SEC	ADULT	CHILD	PAUSE	COMMENTS
		HE VE	YES	YES	
		M I S G R	NO	NO	

CODING SHEET FOR TEACHING STRATEGIES

FAMILY #__________ OBSERVER __________________ DATE______
SESSION#__________ TOY___________________________ PAGE#______

TIME					
MIN	SEC	ADULT	CHILD	PAUSE	COMMENTS
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	
		HE VE M I S G R	YES NO	YES NO	

APPENDIX F

MEANS AND STANDARD DEVIATIONS OF SELF REPORT MEASURES TAKEN PRIOR TO AND FOLLOWING NATURAL TEACHING STATEGIES

Appendix F-1

Comparison of Means on the Parenting Stress Index (PSI) Following the Natural Teaching Strategies Component of the Intervention

PSI Score	Pre Intervention		Post-Intervention	
	Mean	Deviation	Mean	Deviation
Adaptability	30.5	4.8	28.9	4.7
Acceptability	21.9	3.8	20.0	3.1
Demandingness	26.6	4.9	23.7	2.7
Mood	10.5	2.7	10.7	1.8
Distractibility	29.6	5.6	30.6	4.5
Reinforcement	11.5	2.3	10.3	3.6
Depression	22.3	6.0	22.6	6.2
Attachment	15.8	4.1	14.0	3.7
Restriction	20.5	4.8	20.3	7.8
Competence	34.0	4.0	29.9	6.1
Isolation	14.9	3.2	14.0	3.9
Spouse	18.1	4.0	19.1	5.5
Health	14.6	4.3	13.7	3.9
Child Total	130.6	17.5	124.1	21.2
Parent Total	140.1	24.3	133.6	32.6
Total PSI	268.9	43.7	257.7	51.5

Appendix F-2

Comparison of Means on the Social Support Inventory (SSI) Following the Natural Teaching Strategies Component of the Intervention

SSI Score	Pre Intervention		Post-Intervention	
	Mean	Deviation	Mean	Deviation
Spouse	12.9	2.6	12.4	3.6
Children	11.3	3.0	11.7	2.6
Relatives	11.7	1.1	12.1	2.3
Friends	11.0	1.4	11.6	1.9
Co-workers	7.4	2.6	8.7	3.6
Church/Synagogue	6.9	2.9	6.7	3.0
Spiritual Beliefs	8.9	2.9	9.4	2.1
Community Groups	7.7	1.9	7.8	2.7
Professional Groups	9.0	2.3	9.9	0.9
Special Groups	9.0	2.1	9.4	2.0
TV/Books	8.1	2.1	7.6	2.4
Total SSI	109.0	13.9	112.3	17.5

Appendix F-3

Comparison of Means on the Family Inventory of Resources for Management (FIRM) Following the Natural Teaching Strategies Component of the Intervention

FIRM Score	Pre Intervention		Post-Intervention	
	Mean	Deviation	Mean	Deviation
Family Strengths I: Esteem/Communication	31.9	8.2	32.3	6.7
Family Strengths II:	39.2	11.7	40.8	9.9
Extended Family Social Support	9.4	2.1	8.9	2.2
Financial Well-being	35.8	6.7	36.9	6.0
FIRM Total	116.1	20.1	119.3	19.9

Appendix F-4

Comparison of Means on the Coping Health Inventory for Parents (CHIP) Following the Natural Teaching Strategies Component of the Intervention

CHIP Score	Pre Intervention		Post-Intervention	
	Mean	Deviation	Mean	Deviation
Coping Pattern I: Integration/Optimism/ Cooperation	36.0	10.5	34.1	7.7
Coping Pattern II: Support/Esteem/ Stability	25.3	7.7	27.1	7.4
Coping Pattern III: Medical Understanding	15.0	4.8	15.9	2.4
Total:	78.3	19.0	77.1	10.7

Appendix F-5

Comparison of Means on the Concepts of Development Questionaire (CODQ) Following the Natural Teaching Strategies Component of the Intervention

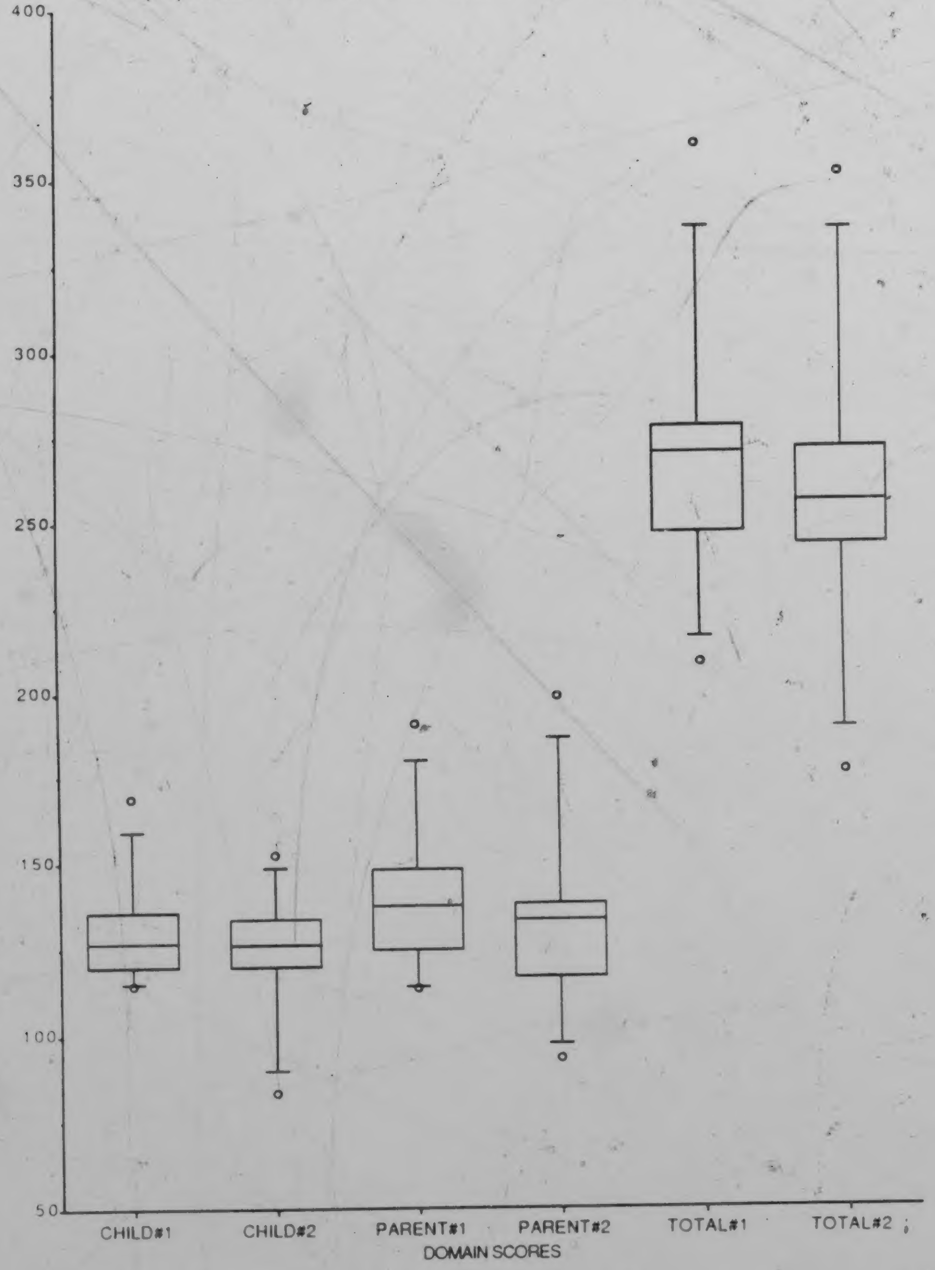
CODQ Score	Pre Intervention		Post-Intervention	
	Mean	Deviation	Mean	Deviation
Categorical Thinking:	.88	.41	.83	.47
Perspectivistic Thinking:	2.10	.25	2.13	.33
CODQ Total	2.11	.32	2.14	.37

APPENDIX G

BOX AND WHISKER PLOTS OF SELF-REPORT MEASURES TAKEN BEFORE AND AFTER NATURAL TEACHING STRATEGIES

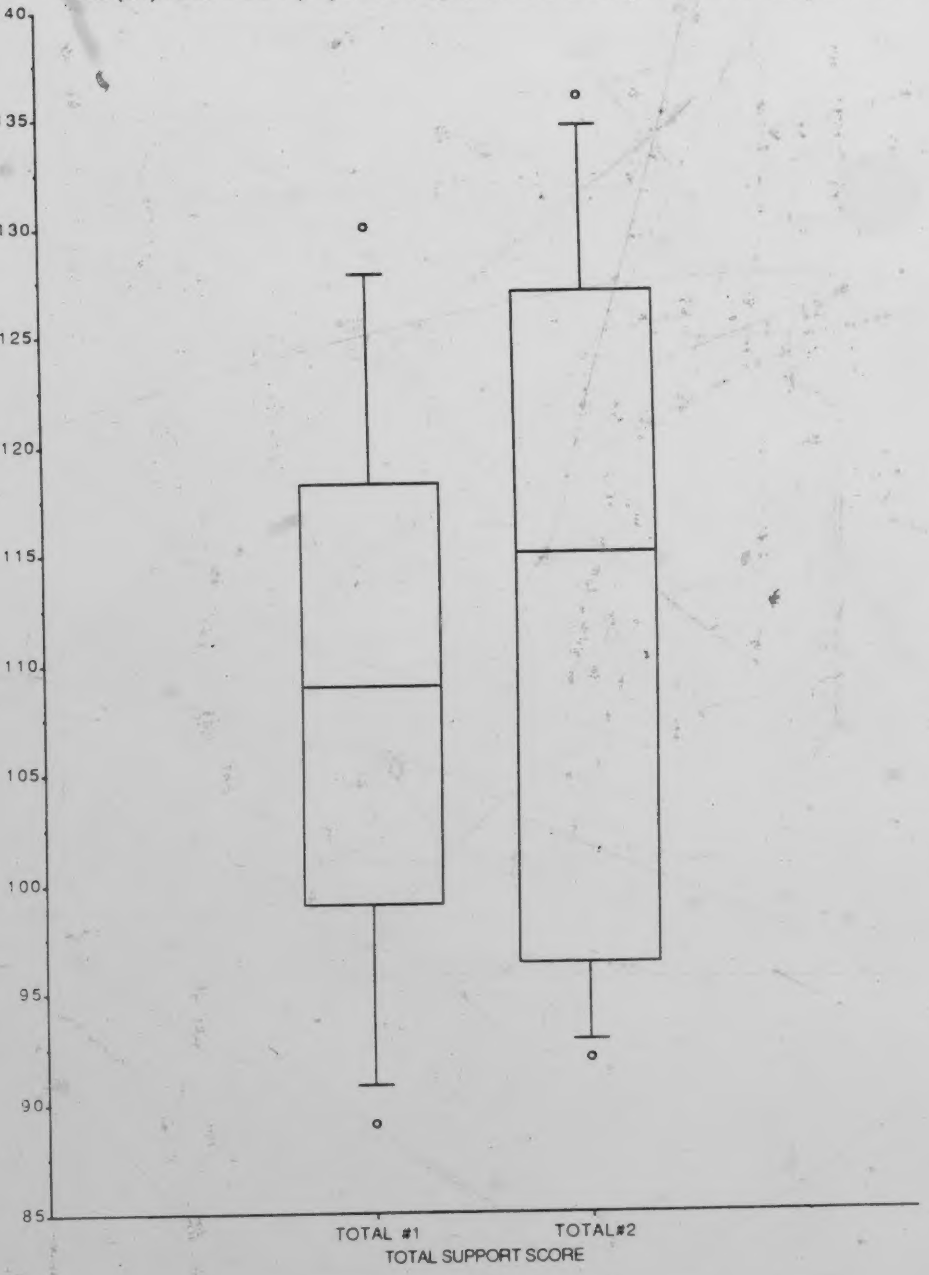
APPENDIX G-1

PRE (#1) AND POST (#2) TEACHING INTERVENTION COMPARISONS FOR THE PSI



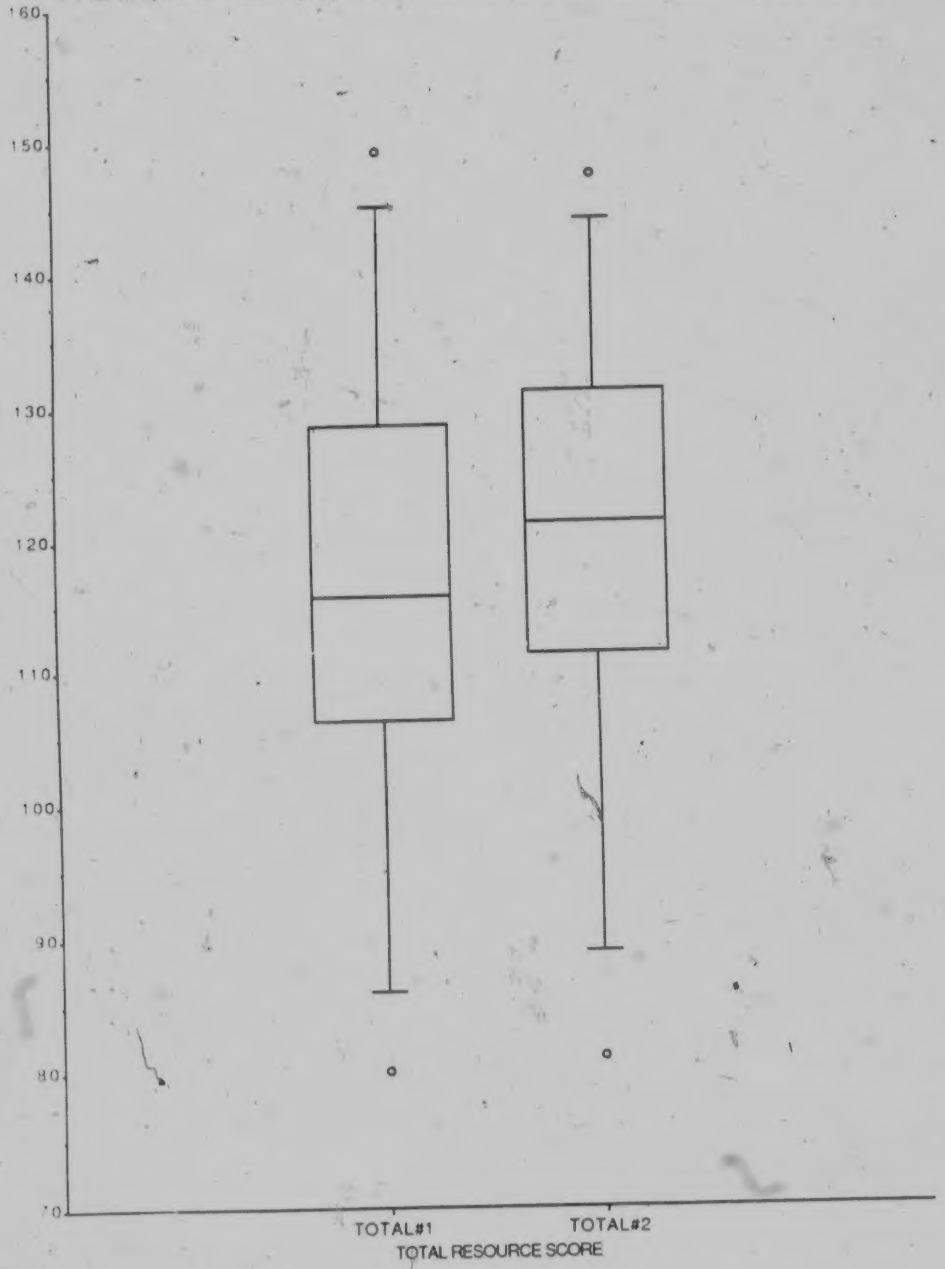
APPENDIX G-2

PRE (#1) AND POST (#2) TEACHING INTERVENTION COMPARISONS FOR THE SSI



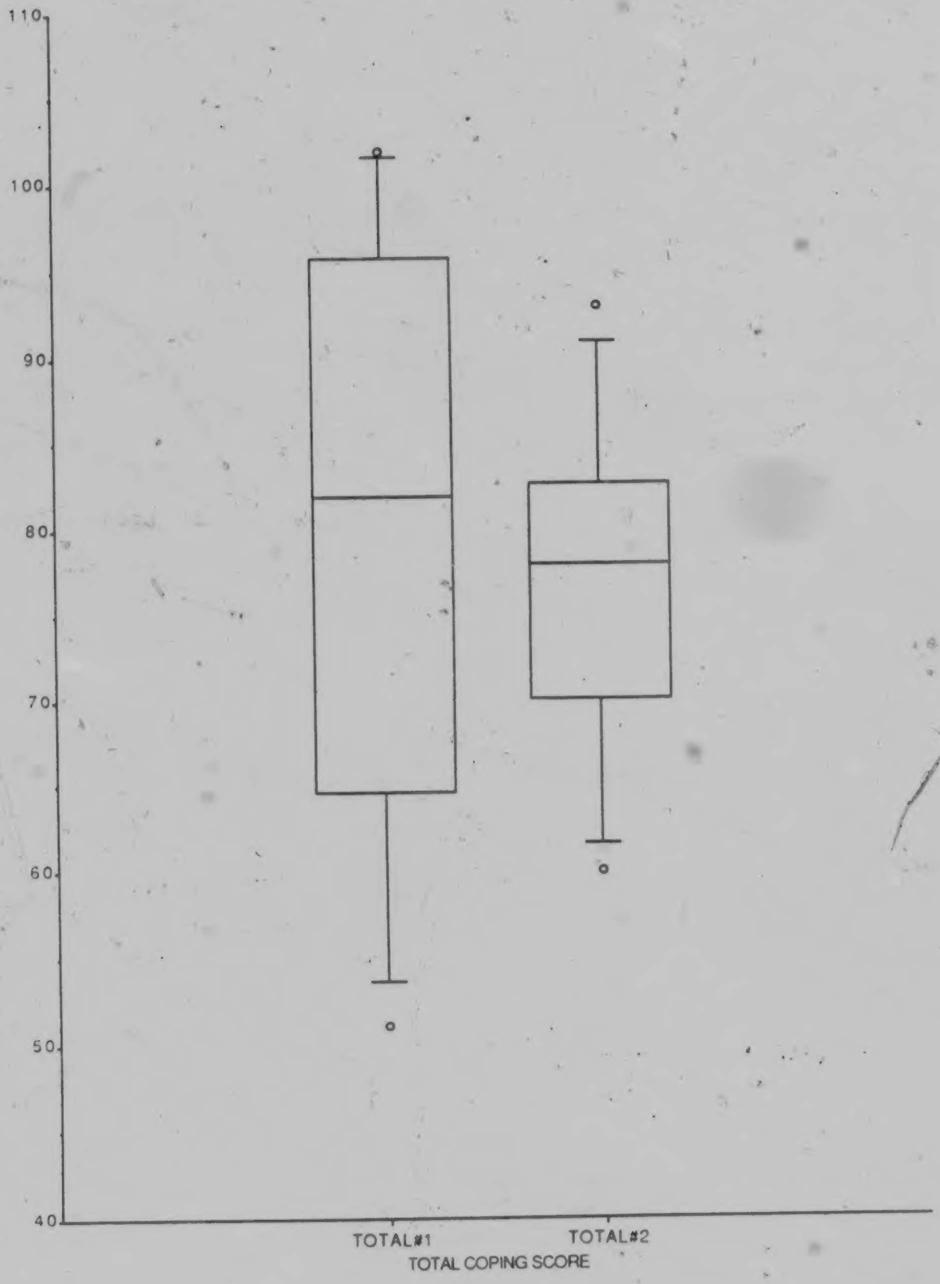
APPENDIX G-3

PRE (#1) AND POST (#2) TEACHING INTERVENTION COMPARISONS FOR THE FIRM



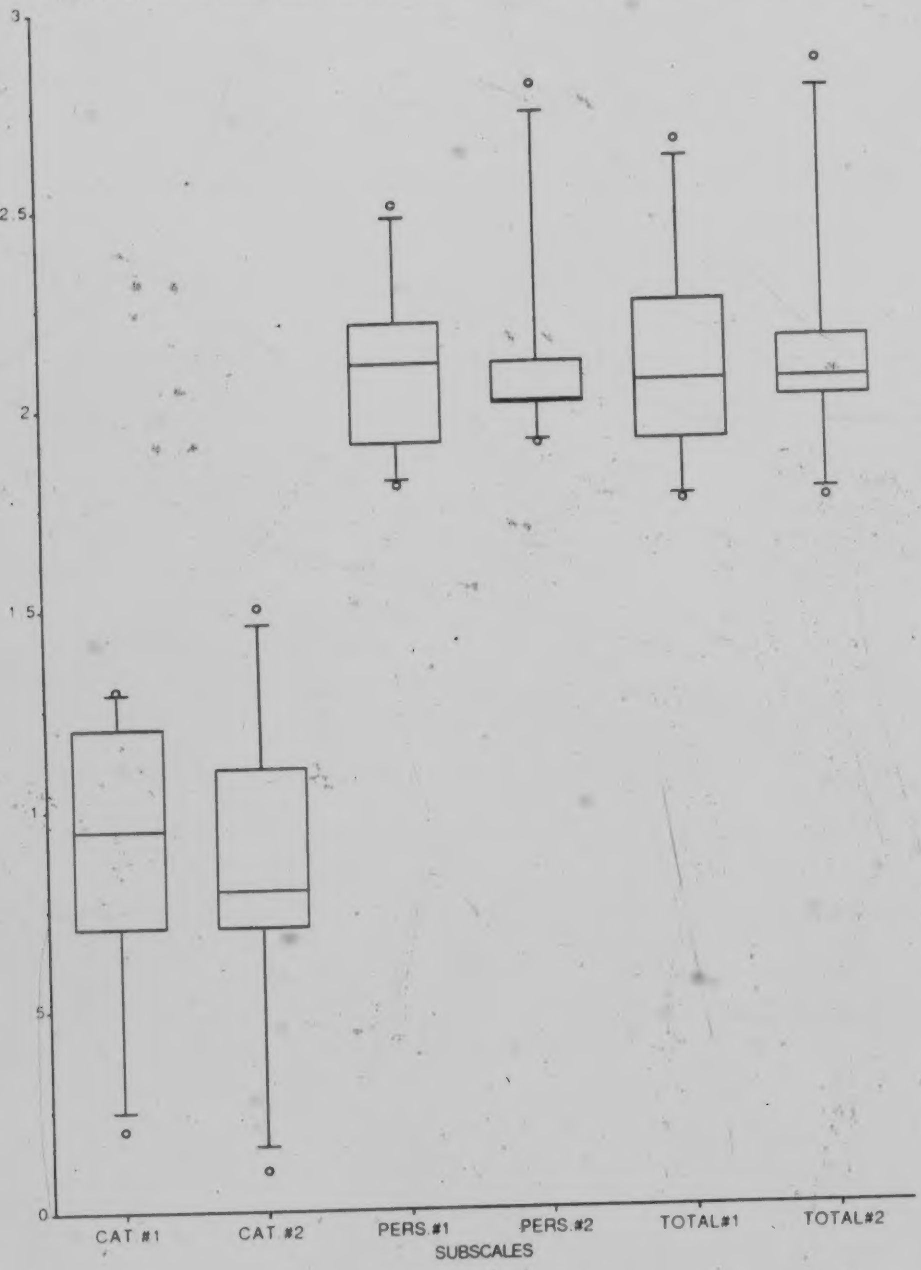
APPENDIX G-4

PRE (#1) AND POST (#2) TEACHING INTERVENTION COMPARISONS FOR THE CHIP



APPENDIX G-5

PRE (#1) AND POST (#2) TEACHING INTERVENTION COMPARISONS FOR THE CODQ



APPENDIX H

MEANS AND STANDARD DEVIATIONS TAKEN AT BASELINE AND FOLLOWING INTERVENTION

II

Appendix H-1

Comparison of Means Obtained at Baseline and Following Intervention II on the Parenting Stress Index

PSI Score	Pre Intervention		Post-Intervention	
	Mean	Deviation	Mean	Deviation
Adaptability	29.4	6.1	28.6	4.7
Acceptability	19.3	2.5	20.0	3.1
Demandingness	23.4	4.7	23.9	6.7
Mood	9.3	2.3	10.6	2.1
Distractibility	27.6	3.5	29.3	6.3
Reinforcement	11.4	2.8	10.0	3.7
Depression	23.4	6.3	22.9	5.9
Attachment	14.0	4.0	14.0	3.8
Restriction	19.7	5.6	20.3	7.8
Competence	30.9	5.8	28.7	6.8
Isolation	15.7	5.9	13.7	4.3
Spouse	18.7	5.6	18.1	6.4
Health	13.9	3.4	13.4	4.4
Child Total	120.4	15.6	122.1	23.5
Parent Total	136.3	29.8	131.1	34.8
Total PSI	252.4	44.4	253.3	56.0

Appendix H-2

Comparison of Means Obtained at Baseline and Following Intervention II on the Social Support Inventory (SSI)

SSI Score	Pre Intervention		Post-Intervention	
	Mean	Deviation	Mean	Deviation
Spouse	13.6	2.5	12.7	3.2
Children	11.7	2.6	11.9	2.5
Relatives	12.4	1.4	11.6	2.5
Friends	11.8	2.3	11.7	1.9
Co-workers	7.7	2.9	8.6	3.6
Church/Synagogue	7.4	3.3	6.9	2.9
Spiritual Beliefs	9.1	1.9	9.5	2.1
Community Groups	7.6	2.3	7.5	2.6
Professional Groups	9.7	0.1	10.0	0.9
Special Groups	9.0	2.2	10.0	0.6
TV/Books	7.3	1.9	7.6	2.4
Total SSI	111.9	11.4	112.6	16.6

Appendix H-3

Comparison of Means Obtained at Baseline and Following Intervention on the Family Inventory of Resources for Management (FIRM).

FIRM Score	Pre Intervention		Post-Intervention	
	Mean	Deviation	Mean	Deviation
Family Strengths I: Esteem/Communication	35.2	5.2	33.6	7.2
Family Strengths II:	37.4	12.2	41.1	10.1
Extended Family Social Support	10.1	2.2	8.9	2.2
Financial Well-being	37.8	12.2	38.0	7.0
FIRM Total	120.5	21.5	121.6	21.7

Appendix H-4

Comparison of Means Obtained at Baseline and Following Intervention II on the Coping Health Inventory for Parents (CHIP)

CHIP Score	Pre Intervention		Post-Intervention	
	Mean	Deviation	Mean	Deviation
Coping Pattern I: Integration/Optimism/ Cooperation	37.4	10.4	35.4	8.6
Coping Pattern II: Support/Esteem/ Stability	27.1	7.1	26.9	4.5
Coping Pattern III: Medical Understanding	15.9	4.5	15.6	2.4
Total:	79.4	15.9	77.9	10.6

Appendix J-5

Comparison of Means Obtained at Baseline and Following Intervention II on the Concepts of Development Questionnaire (CODQ)

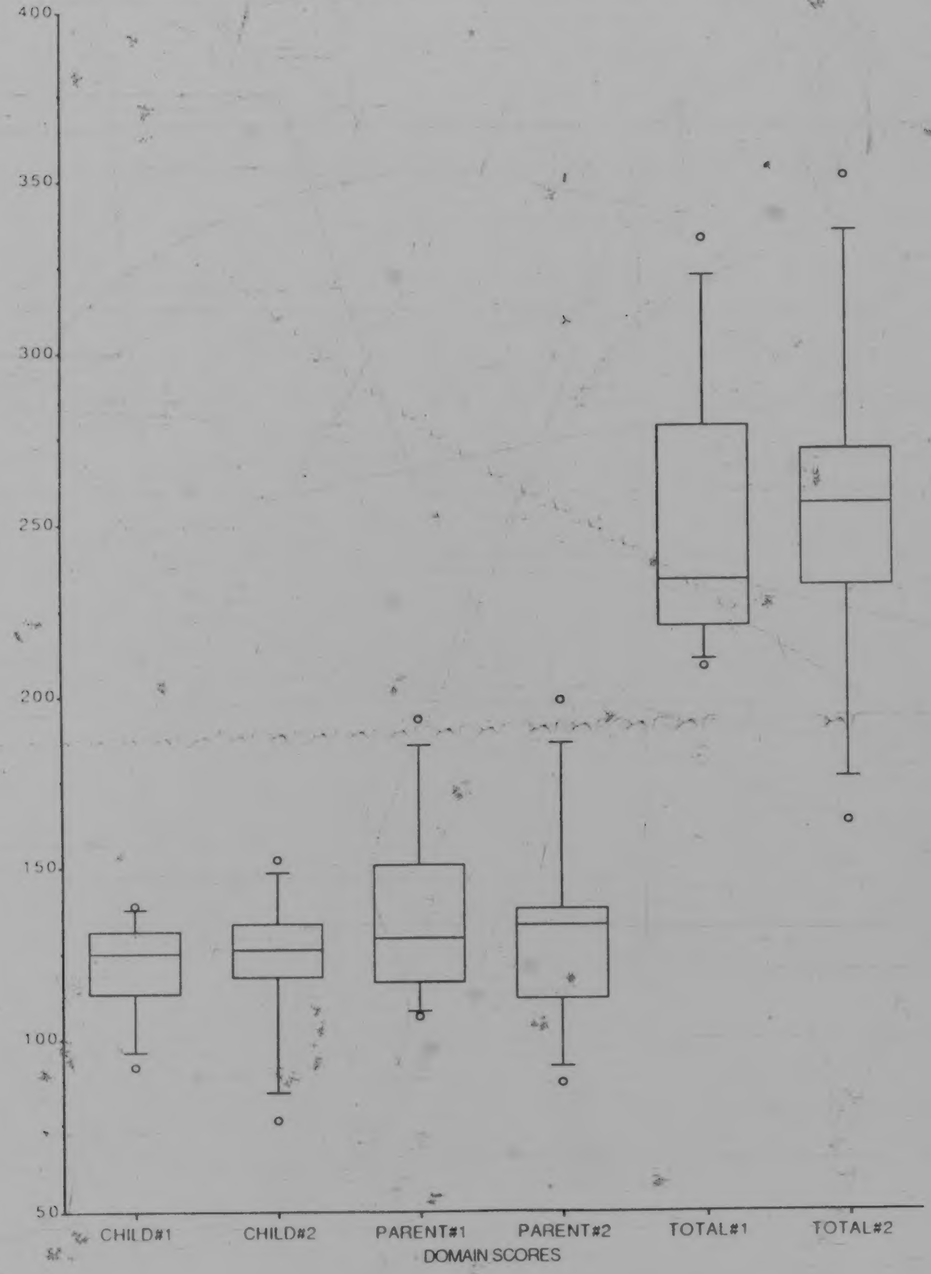
CODQ Score	Pre Intervention		Post-Intervention	
	Mean	Deviation	Mean	Deviation
Categorical Thinking:	.91	.35	.94	.36
Perspectivistic Thinking:	2.10	.24	2.04	.17
CODQ Total:	2.09	.26	2.06	.29

APPENDIX I

BOX AND WHISKER PLOTS OF SELF-REPORT MEASURES TAKEN AT BASELINE AND FOLLOWING INTERVENTION II

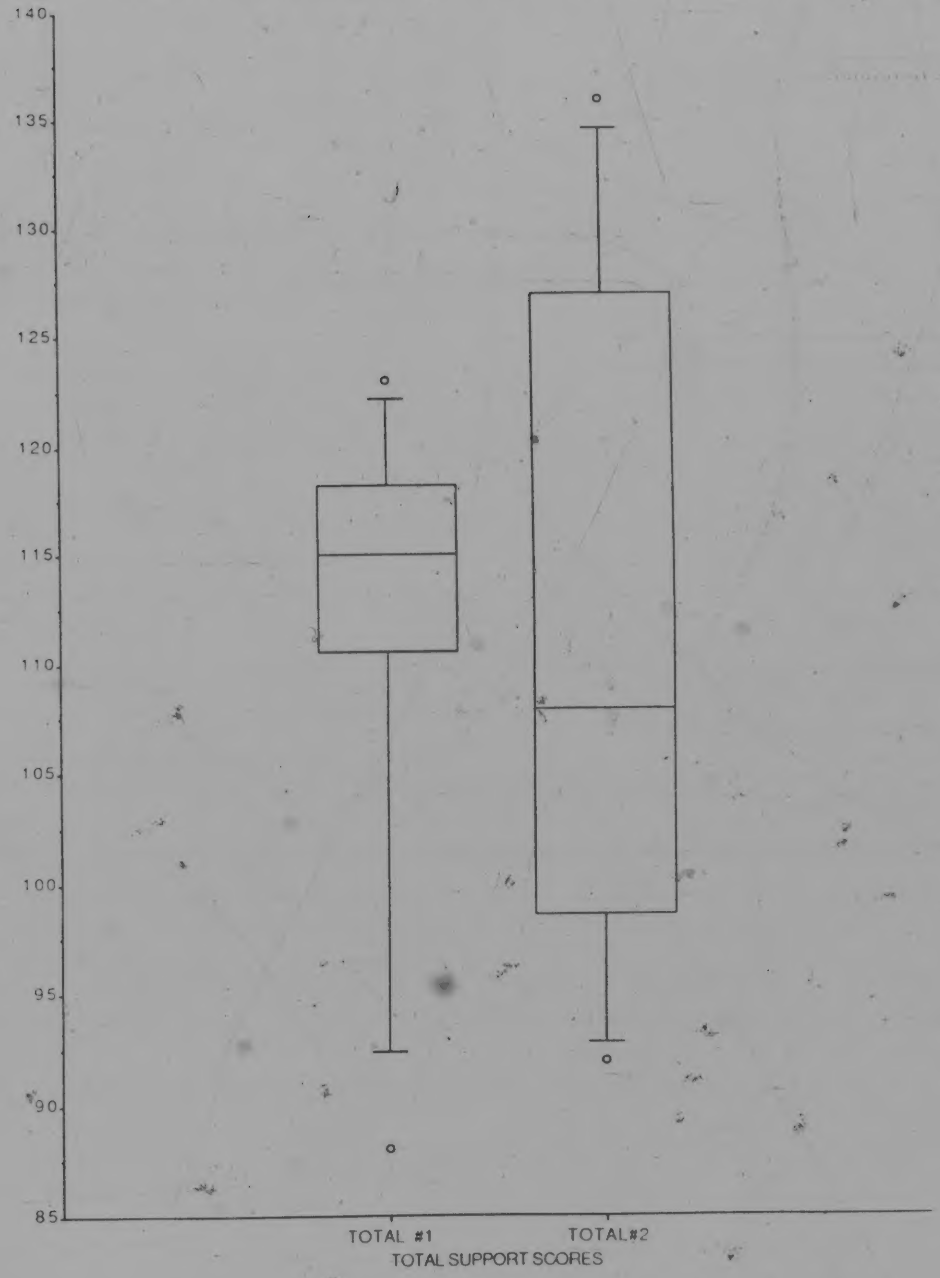
APPENDIX I-1

COMPARISONS BETWEEN BASELINE AND INTERVETION II ON THE PSI



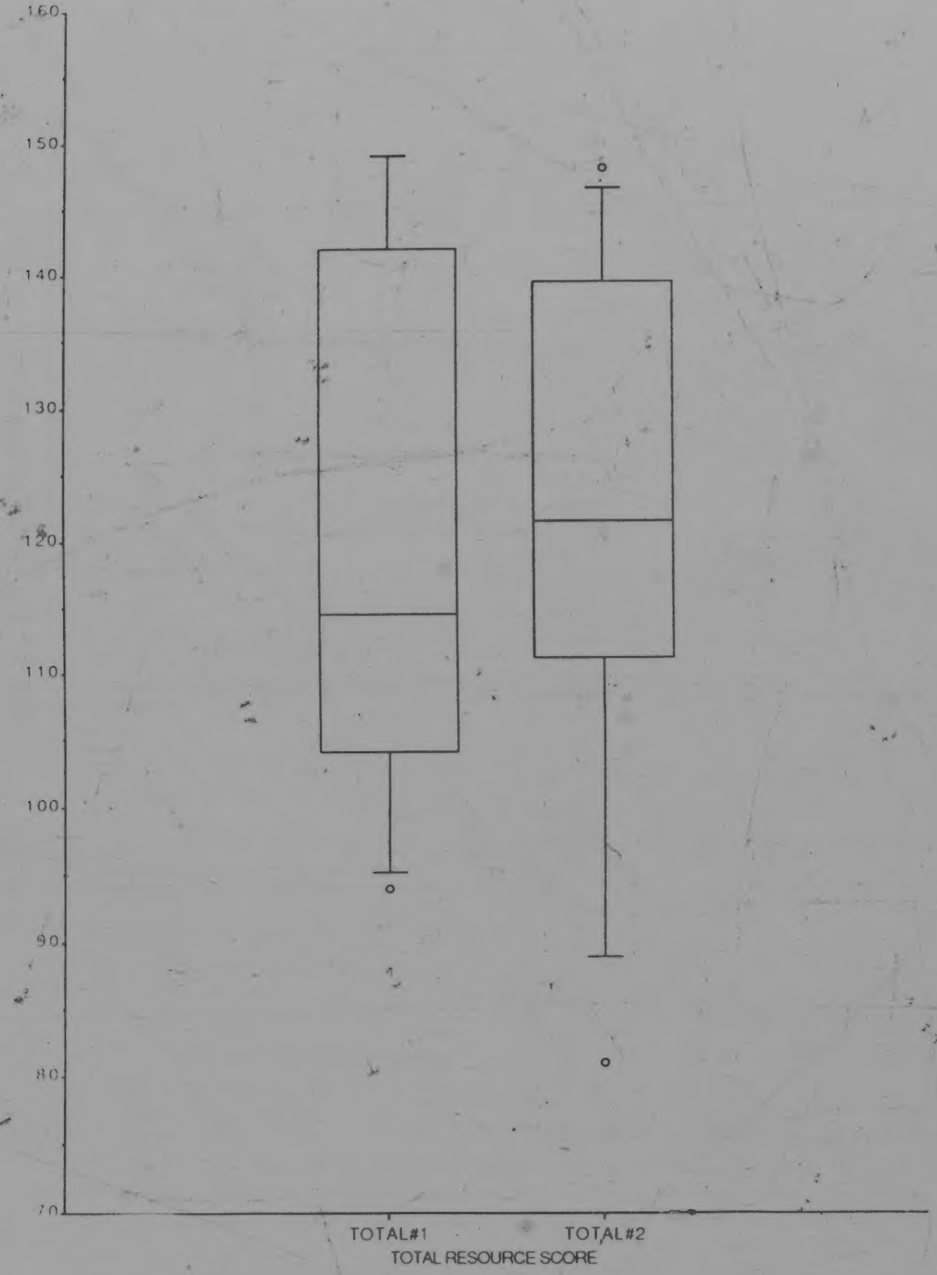
APPENDIX I-2

COMPARISONS BETWEEN BASELINE AND INTERVETION II ON THE SSI



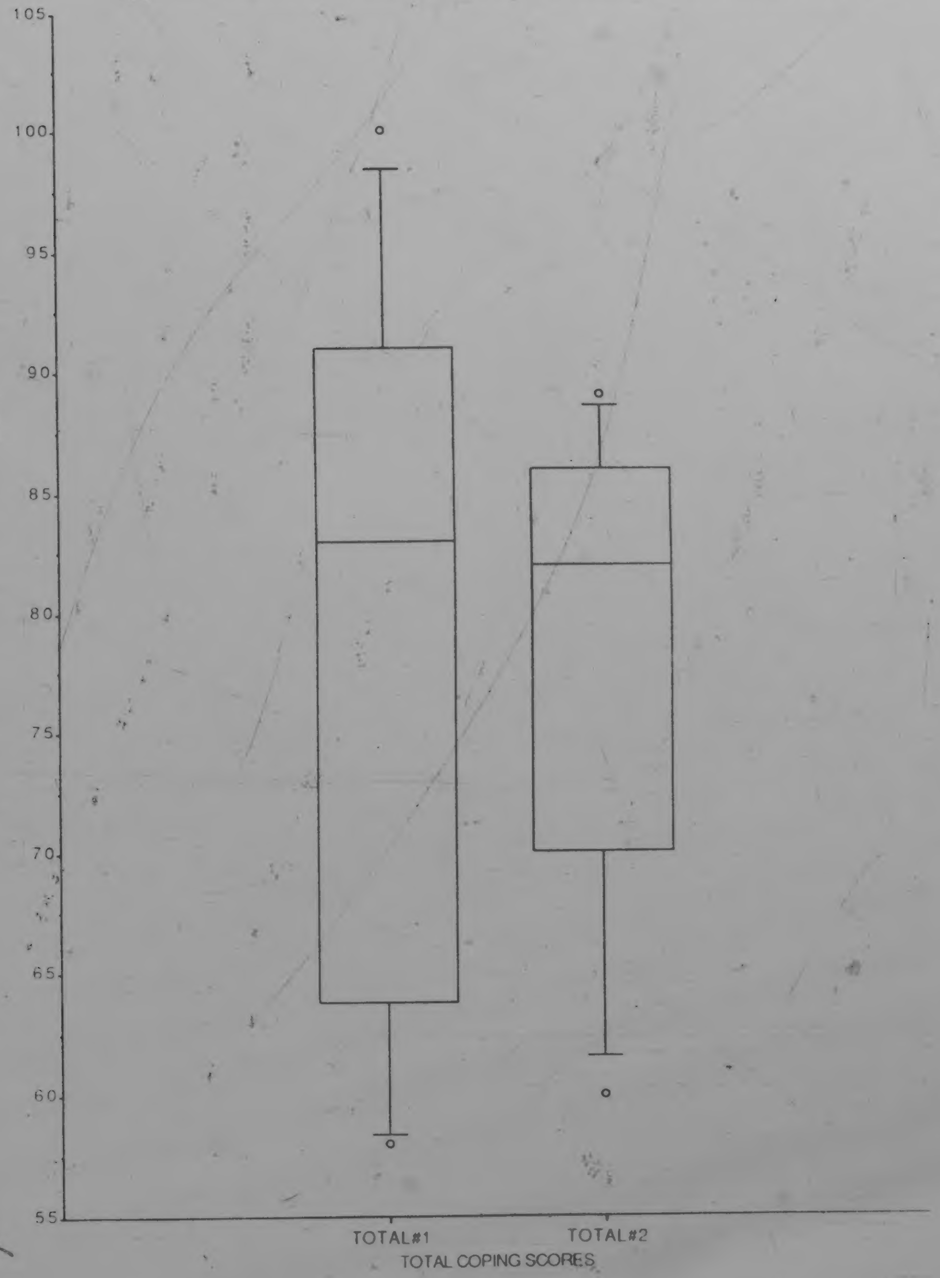
APPENDIX I-3

COMPARISONS BETWEEN BASELINE AND INTERVETION II ON THE FIRM



APPENDIX I-4

COMPARISONS BETWEEN BASELINE AND INTERVETION II ON THE CHIP



APPENDIX I-5

COMPARISONS BETWEEN BASELINE AND INTERVETION II ON THE CODQ